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REPORT NUMBER FHWA-MASS-EIS-77-01-D
FEDERAL HIGHWAY ADMINISTRATION
REGION 1

GOVDOC
BRA
4137

DRAFT
ENVIRONMENTAL
IMPACT
STATEMENT

**U.S. ROUTE I-93
U.S. ROUTE 1**

CENTRAL ARTERY - BOSTON, MASSACHUSETTS

**U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION**

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C.2

MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

FHWA-MASS-EIS-77-01-D
Federal Highway Administration
Region I

U.S. Interstate 93
U.S. Route 1

Charlestown (Boston)
Suffolk County
Cambridge
Middlesex County
Massachusetts

ADMINISTRATIVE ACTION
DRAFT
ENVIRONMENTAL IMPACT STATEMENT

UNITED STATES DEPARTMENT OF TRANSPORTATION
Federal Highway Administration
and
COMMONWEALTH OF MASSACHUSETTS
Department of Public Works

Submitted pursuant to 42 U.S.C.4332(2)(C) and 23 U.S.C.128(a)

26 MAY 1977

86 46 ..

Date

William J. Kenney
Division Administrator
Federal Highway Administration

ACKNOWLEDGEMENT

This Environmental Impact Statement was prepared by and with the active involvement of the Central Artery Staff of the Massachusetts Department of Public Works, the Central Transportation Planning Staff, and the U.S. Department of Transportation, Federal Highway Administration.

In addition, during the course of study, meetings were held with public officials and representatives of public and civic groups, as well as with private citizens. The cooperation of all is hereby gratefully acknowledged.

Agencies and Organizations From Which Comments are Being Solicited

Federal Agencies and Elected Officials State and Regional Agencies

Department of Interior	Department of Community Affairs
National Park Service	Department of Commerce and Development
Department of the Army, Corps of Engineers	Executive Office of Environmental Affairs
Department of Commerce	Department of Environmental Management
Department of Health, Education, and Welfare	Division of Forests and Parks
Department of Housing and urban Development	Division of Environmental Health
Department of State	Division of Fisheries and Wildlife
Department of Agriculture	Executive Office of Transportation and Construction
Office of Economic Opportunity	Executive Office of Communities and Development
Advisory Council on Historic Preservation	Executive Office of Human Services
Environmental Protection Agency	Executive Office of Public Safety
Interstate Commerce Commission	Governor's Office
Federal Power Commission	Governor's Advisory Committee on Transportation
General Services Administration	Joint Legislative Committee on Transportation
United States Atomic Energy Commission	State Conservationist
Federal Energy Office	Massachusetts Historical Commission
Honorable Edward M. Kennedy	Office of Planning and Program Coordination
Honorable Edward W. Brooke	State Archaeologist
Honorable Thomas P. O'Neill, Jr.	Metropolitan District Commission

Local Agencies and Elected Officials

Mayor of Boston	Department of Public Utilities
Boston City Council	Massachusetts Aeronautics Commission
Cambridge City Council	Division of State Colleges
City Manager, Cambridge	Executive Office of Elder Affairs
City of Boston	Executive Office of Administration and Finance
Public Facilities Commission	Executive Office of Consumer Affairs
Public Library	Executive Office of Educational Affairs
Charlestown Branch Library	Executive Office of Manpower Services
Public Services	Metropolitan Area Planning Council
Boston Redevelopment Authority	Massachusetts Port Authority
Conservation Commission	Mass. Bay Transportation Authority
Historic Landmark Commission	
Boston Housing Authority	
Public Works	
Traffic and Parking	
EDIC	
Office of Program Development	
Charlestown Little City Hall	
Cambridge	
Conservation Commission	
Transportation Forum	
Communities and Development	
Planning Board	
Historical Commission	
Redevelopment Authority	
Library	
Traffic and Parking	

State Elected Officials

Rep. Michael Lombardi
Rep. O. Roland Orlandi
Rep. Barney Frank
Rep. John Melia
Rep. Louis Nickinello
Rep. Mary Goode
Rep. Michael Flaherty
Rep. Raymond L. Flynn
Rep. Elaine Noble
Rep. John J. Finegan
Sen. Edward L. Burke
Sen. Michael LoPresti
Rep. William Bulger

Private Agencies and Individuals

Greater Boston Chamber of Commerce
Joint Regional Transportation Committee
Beacon Hill Civic Association
Neighborhood Association of Back Bay
Boston Harbor Associates
Waterfront Residents Association
North End Union
Cambridge Street Development Corporation
Downtown North Merchants Association
Massachusetts General Hospital
Massachusetts Rehabilitation Hospital
No. End Rehabilitation and
 Conservation Commission
Citizens for Rail Transportation
Sierra Club
Mass Audubon Society
Citizens Housing and Planning Association
Construction Industries of Massachusetts
League of Women Voters
Middlesex Canal Association
Cambridge Chamber of Commerce
Cambridge League of Women Voters
Charlestown YMCA
JFK Family Service Center
Charlestown Historical Society
Charlestown Preservation Society
Charlestown Merchants Association
Charlestown Patriot

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SUMMARY

CHAPTER I - SUMMARY

- I-(1) Federal Highway Administration
Administrative Action Environmental
Statement.

(X) DRAFT () FINAL

- I-(2) For additional information, please contact:

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- I-(3) Description of the North Area -
Central Artery (I-93) Project.

The Massachusetts Department of Public Works proposes to reconstruct the expressway interchange of Interstate 93 (I-93) with the Mystic River Bridge (Route 1) in the City of Boston (Charlestown section) and Cambridge, by either replacement of existing viaduct roadway or total construction of the interchange in a new configuration.

- I-(4) Alternatives.

One "No-Build" and two "Build" alternatives are under consideration. The "no build" alternative would replace existing concrete roadways on the viaduct structures of the interchange. Of the two "build" alternatives, Alternative 2 replaces viaduct roadways and produce surface street improvements while Alternative 3 would realign approaches from I-93 to the Mystic River Bridge on a new right-of-way, improve local surface streets and remove the existing overhead structures in the

City Square area of Charlestown.

I- (5) Need for project

The existing interchange operates at level of service F during peak hours. It has been identified as the highest accident prone location on the State Highway System with 244 accidents occurring in 1975.

I- (6) Impacts

The impact of the "no build" or alternative 2 will continue the traffic operational and accident problems of the area. Realignment of approaches, alternative 3, will have the benefical effects of improving traffic flow and reducing accidents as well as inproving the City Square area. Only with the realignment alternative would displacements be required. These are: a tavern, YMCA, state maintenance depot, and a vacant building. No households would be displaced in any alternative.

The "no build" or alternative 2 will not allow for future development potential or an improved community environment. Alternative 3 does allow for future development potential & improved environment in the Charlestown community.

The major impacts of all alternatives are the construction impacts. Each alternative results in disruption and delays to traffic, community disruption, and increased noise levels during the construction period. While temporary, the duration for the "no build" and alternative 2 is estimated to be one year while alternative 3 is estimated to be three years.

Upon completion of construction alternative 3 results in a slight noise reduction in the area adjacent to City Square and a slight increase (1-2 db)

in the industrial area west of I-93.

I- (7) 4/f Involvement

Both "build" alternatives would require taking a traffic island, about 8500 square feet, called City Square Park. The Parks and Recreation Department of the City of Boston has determined that this property is not significant for the purposes of Section 4(f). A section of the report addresses potential Section 4(f) issues.

**CONTEXT AND PURPOSE OF
PROPOSED IMPROVEMENTS**





CHAPTER II. CONTEXT AND PURPOSE OF PROPOSED IMPROVEMENTS

II.A PROPOSED ACTION

The proposed transportation improvements evaluated in this Environmental Assessment are to be located in Charlestown, (a portion of Boston) and Cambridge, Massachusetts. The improvements have three elements: deck repairs, surface street improvements and expressway improvements. The expressway improvements include straightening the s-curve at the foot of the Mystic Bridge, two tunnels under City Square in Charlestown to connect with two new loop ramps which connect I-93, the Mystic Bridge and the Central Artery, and removal of existing elevated expressway ramps over City Square.

These new facilities and improvements are directly related to existing transportation problems in the area and the regional network of expressways and to other improvements and new developments in the project area.

II.B THE NORTH AREA

The North Area is located on a peninsula and on filled land to the north of Downtown, bounded by the Charles and Mystic Rivers and the Inner Harbor. The original peninsula that contained the Charlestown settlement was expanded by filling around the edges to accomodate industrial development. The North Area is isolated from surrounding districts by bodies of water, highways and bridges, rail lines and major local street connections. The transportation facilities and many of the industrial uses have had a blighting effect on the area.

That portion of Cambridge which lies in the North Area is entirely industrial and is separated from the remainder of Cambridge by Msr. O'Brien Highway, the rail yards, and the Prison Point (Judge Gilmore) Bridge.

The area was originally saltmarshes which were filled for industrial uses in the early 19th Century. Present industries are a mixture of uses - principally warehousing. The largest single land use is a concrete plant - the only operation of its kind in the inner city area.

Charlestown is an older residential and industrial community with a population of approximately 16,000. The population has been steadily declining over the last 30 years, though this trend appears to be reversing. The community's population structure has remained stable, consisting mainly of descendants of Irish settlers, Canadians, and a recent influx of people of varied ethnic background. Over 98% of the population is white, mostly clerical or blue collar workers with a 1970 median household income of \$9000.

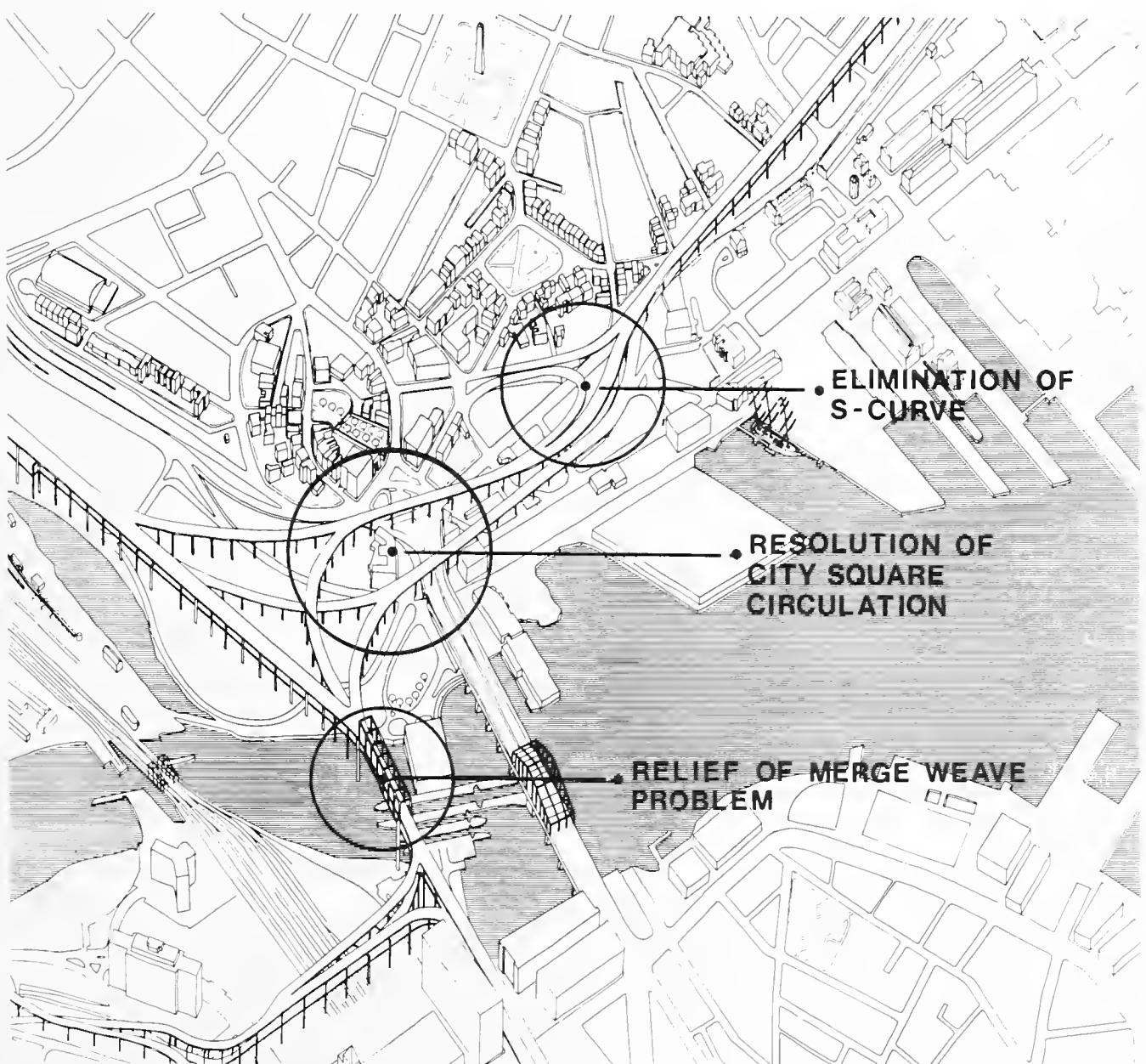
Tax assessments and housing costs are low. There are three low and moderate income housing projects in the community. Recent urban renewal efforts and removal of the elevated Orange Line have encouraged interest in the Town by outsiders. Private renovation is taking place, along with a variety of public efforts in renewal and restoration. The residential community is clustered around the hills in the center of the old peninsula and is surrounded by older harbor-related activities and industrial uses.

The major industrial uses along the water's edge are a sugar refinery, a scrap yard, the Moran Terminal - a major new container facility owned and operated by the Massachusetts Port Authority, the Boston Naval Shipyard - recently decommissioned by the federal government - and a mix of uses on remaining piers. Two new developments along the water's edge are a new Charles River Dam and Paul Revere Landing Park. The industrial uses in Charlestown extend along the edge of the residential community to the west along Rutherford Avenue. They include food processing plants and a renewal site now occupied by the Bunker Hill Community College. A substantial amount of land at the edge of the community remains vacant because of industrial decline, renewal clearance and the negative effects of overhead transportation facilities.

II.C

PURPOSE OF THE PROPOSED ACTIONS

The major purpose of the proposed actions is to improve North Area safety and roadway operations. The North Area has been identified as the highest accident location in the state highway system, with 244 accidents reported in 1975. The proposed actions include measures to reduce the incidence of accidents in the North Area. Improvements to roadway operations include: improving expressway operations, particularly during



PURPOSE OF THE PROPOSED ACTION

FIG. II-1

peak hours; improving local street operations, especially in City Square; reducing regional traffic impacts on local streets; and improving access from Charlestown to the expressways. In addition to transportation improvements, a secondary benefit will be to improve the environment of the City Square area.

The need for these improvements is summarized as follows:

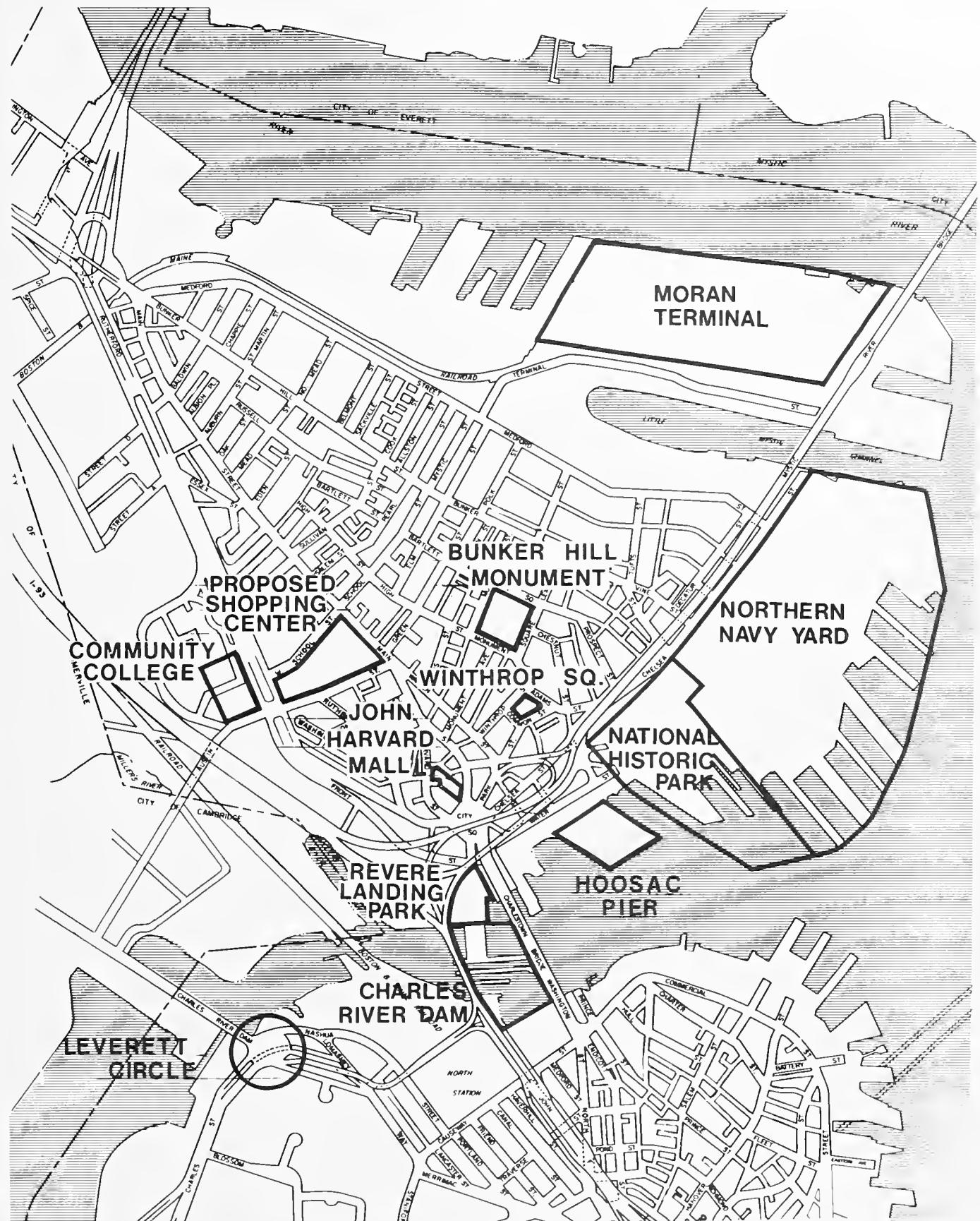
1. Short merging and weaving, producing major congestion and queues during peak hours.
2. Highest accident location in the state.
3. Heavy through traffic on local streets.
4. Access limited from Charlestown to expressways, especially during peak hours.

II.D PLANNING BASIS FOR THE IMPROVEMENTS

The proposed improvements are part of a coordinated planning effort for transportation improvements in the Central Artery Corridor. The North Area proposals are not contingent upon subsequent plans or decisions that might be made for other improvements in the Corridor; however, they are compatible with them. The proposals for North Area project have been developed with the requirement that they be compatible with related plans or future decisions. All of the proposals that are set forth in this document meet these conditions.

The planning is being done through cooperation of a number of agencies at all levels of government, under the general leadership of the Mass. Department of Public Works. Federal agencies are providing both planning support and funds in various categories for project related efforts.

The residential neighborhoods of Charlestown have undergone substantial improvements through urban renewal and community development projects. Some of this is still underway. Because of its long history as a



PROJECT RELATED LAND USE

FIG. II-2

residential community and because of the continuing efforts by the city to improve the area, Charlestown is recognized as a strong and long-settled community. This stability has been recognized in all planning for transportation improvements in the area.

The former Boston Naval Shipyard is being redeveloped as a National Park site and other uses are proposed, such as hotel, institutional, housing, commercial and light industry.

The Paul Revere Landing Park and Charles River dam are under construction and will be completed in 1978. These improvements will improve flood control and navigation in the Charles River and will allow more access by residents to the waterfront than now exists. These improvements are also part of the planning context within which any transportation improvements must be considered.

Between the residential community, the naval shipyard, and the dam and park, much of the land is used for transportation purposes, including the expressway approaches to the Mystic Bridge and the supports for them, along with local streets. Approximately 10 acres of vacant land exists as well. Much is under the overhead expressway ramps, and adjacent lands are less attractive for development because of the negative impacts of the highways. In all of this area, there are few scheduled improvements. One of these is the proposed connection between Water and Chelsea Streets, which would give improved access to the Moran Terminal and the navyyard.

II.D.1 Planning Agencies

As a part of the City of Boston and the metropolitan region, Charlestown's planning is conducted by a number of agencies on different levels of government with a variety of special concerns. The Boston Redevelopment Authority carries out local planning and zoning activities through a district planner assigned to the area. The BRA also manages the urban renewal projects, and coordinates local transportation projects with the Massachusetts Department of Public Works. The redevelopment of the Naval Shipyard is a special effort of the BRA and the city's Economic Development and Industrial Commission. The National Park portion of the Shipyard is being developed by the National Park Service with the cooperation of the BRA.

Local street planning is the responsibility of the BRA, and the city's Department of Traffic and Parking, with the involvement of the MDPW in larger projects. Expressway planning is done by MDPW. The Massachusetts Port Authority administers the Tobin Bridge and coordinates with the other agencies in planning. The Massachusetts Bay Transportation Authority operates the buses and transit services for the local community.

The Executive Office of Transportation and Construction, the Massachusetts Department of Public Works, the Metropolitan Area Planning Council, the MBTA and the Advisory Board to the MBTA have jointly established two groups which are involved in transportation planning in the region. The Joint Regional Transportation Committee provides overall policy advice in matters of areawide concern in transportation decision making. The Central Transportation Planning Staff conducts long-range transportation planning and analyses for major transportation policy issues and assists the agencies in developing particular transportation projects and programs.

II.D.2 Planning Process

Planning efforts are generally sponsored by the agencies within the responsibilities outlined above, and are carried out in coordination and consultation with the other concerned agencies. Citizen participation is an element of the planning process. A complete discussion of the public participation process in this area may be found in Chapter VII.

II.D.3 Previous Related Studies

Interim Report for Charles River on Flood Control and Navigation, 1968, New England Division, Corps of Engineers.

Plan for Acquisition and Use of Railroad Rights-of-Way, 1972, Mass. Bay Transportation Authority, Thomas K. Dyer, Inc..

Areawide TOPICS Plan, Charlestown (Boston), Mass., 1972, Commonwealth of Massachusetts, Department of Public Works, Tippetts-Abbett-McCarthy-Stratton.

Feasibility Study for Bridge Crossing of Little Mystic at Chelsea Street, 1972.

The BRA felt the bridge has merit in removing traffic from local streets, and so had this study done to determine its feasibility.

Central Artery Feasibility Study prepared by BRA for MDPW; 1975. Within the context of examinations of potential improvements to the Artery corridor, this study first examined the proposed loops and trumpet ramp in the Charlestown/Cambridge area.

Interstate Route 93 Corridor Traffic Operations Study, 1973, Commonwealth of Massachusetts, Department of Public Works, Wilbur Smith and Associates.

A Proposal for a National Historic Park and Naval Museum, Charlestown Navy Yard, 1973 Boston Redevelopment Authority. This proposal documented the historic buildings and suggested a National Park based on the Shipyard and the USS Constitution.

Land Use and Transportation Study, Boston Naval Shipyard, 1974. The BRA and the city's Economic Development and Industrial Commission sponsored this study to develop possible reuse plans for the Shipyard, and to identify solutions to the access problems of the yard. It recommended the Chelsea-Water Streets connection, and mentioned the possibility of the bridge over the Channel.

Container Port Study, 1974. This study for Mass Port, the BRA, and the Boston Shipping Association, examined the expansion possibilities of existing container facilities as well as possible new sites. One of the elements favoring expansion of Moran was the possibility of improved truck access to be provided by a low level bridge across the Little Mystic Channel to Chelsea Street.

Chelsea-Water Streets Connector Draft EIS, MDPW; 1975. The goals for Charlestown within the larger purpose of this study were to reduce traffic on Lowney Way and to continue to provide all traffic movements available today.

The John F. Kennedy Museum, Charlestown Naval Shipyard/A Proposal, BRA 1975. This brochure proposed locating the Kennedy Museum on Shipyard property outside the National Park. The Chelsea-Water Street connection and the Little Mystic Bridge were presented as a way of achieving improved access to the site.

Boston Naval Shipyard, An Alternative for Development, National Park Service, 1975. This is the Park Service's initial planning document. It recognizes the need for linking Chelsea and Water Streets to provide access, and as a way of eliminating through traffic from the proposed park area.

Boston Naval Shipyard at Charlestown, Plan and Development Program, BRA, 1975. This document describes the plan and development program for the Naval Shipyard.

Central Artery Corridor, North Area Planning Study, MDPW and CTPS, Oct. 11, 1976. This document was prepared to establish the corridor improvements proposed for the North Area and draws on previous studies and recent MDPW and CTPS work.

II.D.4 Current Planning Efforts

The following is a summary of the current planning efforts taking place in the North Area and adjacent areas. These efforts have been summarized here to establish the general planning context in which the improvements for North Area transportation facilities will be developed. Each of these projects are shown on Figure II-2.

1. Charlestown Urban Renewal Project

As accepted by HUD in 1965, this project is nearly complete. New housing and commercial facilities are underway or completed, and several other parcels are committed and await changes in financing circumstances. A number of parcels along Chelsea Street and near City Square are under development pressure, but uncertainty about future road alignments related to the expressway network keeps them vacant.

Plans are underway to incorporate the balance of the Naval Shipyard, which is not in the new National Park, into the Charlestown's urban renewal project area. The city is investigating the feasibility of commercial/industrial re-uses of the northern two-thirds of the Shipyard.

2. U.S.S. Constitution National Park

Plans are being developed to make the southwest corner of the former Naval Shipyard (23 acres) into a national park centered on the U.S.S. Constitution. This park, at the

foot of the Mystic Bridge, along with the Bunker Hill Monument and Monument Square, would be part of a scattered site national historic park with other sites in Downtown Boston, such as Old North Church and Paul Revere's House. The park is expected to generate as many as 1,500,000 visitors per year when it is completed; approximately 700,000 people now visit the U.S.S. Constitution each year. Park plans do not include on-site visitor parking, although a bus unloading area may be provided. The Park Service will retain control over access to the Navy Yard; plans are to allow pedestrian access through Gate 1, and vehicular access through Gate 4, the only other entrance to the Park portion of the Shipyard.

3. Northern Navy Yard

Initial planning for the re-use of the northern part of the Navy Yard was undertaken jointly by EDIC and BRA. The BRA is now planning for the following major uses: several museums and institutions, housing, hotel, convention center, retail and restaurant, marina, and some light industry. The access to this development will be primarily through Gate 5. Parking will also be provided for National Park visitors. There is also the possibility of access to the Navy Yard through Gate 4.

4. Hoosac Pier Area

The Massachusetts Port Authority holds this property along with several other parcels between the waterfront and Water Street. A new pavilion housing a diorama of the revolutionary Battle of Bunker Hill has been constructed on part of this land. The huge pier is now used primarily for storage; plans for its future use have not yet been developed. Adjacent to the pier is a new marina, developed privately with Massport assistance. Plans are underway to expand the boating facilities at this location and to improve the physical appearance of the surrounding waterfront.

The Rapids Furniture Company Warehouse, located between the marina and the Charlestown Bridge, is being studied by a consultant investigating park-related uses for that site.

5. Paul Revere Landing Park and Charles River Dam

The new Charles River Dam and locks are under construction; following completion, a small triangular parcel on the Charlestown side

will be developed as a park to commemorate Paul Revere's landing on this site on April 18, 1775, to begin his famous ride. The park is bounded by the dam, the Charlestown Bridge and the Artery connectors overhead.

6. City Square Improvements

Proposed improvements to the City Square area have been examined for some time, but are presently being held in abeyance pending North Area studies. Proposals include improving the flow of traffic in City Square by completing the connection between New Rutherford Avenue and the Charlestown Bridge, and by relocating the present parking front of the Court House. Pedestrian crossings are an integral part of the improvements, including links between the new National Park and Bunker Hill, Winthrop Square and other places of historic interest in residential areas of Charlestown. A safe, pleasant continuation of the Freedom Trail from the North End is also desirable.

7. Chelsea-Water Street Connector

A proposed solution to connections between the City Square area and the Naval Shipyard is the link between Water and Chelsea Streets. This connection, if built, would allow for completion of the perimeter arterial system around Charlestown, and would be completed prior to construction of any of the North Area alternatives. It would take heavy truck traffic off local streets and provide direct access to the new uses at the Naval Shipyard. If further augmented by a new bridge over the Little Mystic Channel, access to the Moran Terminal area would be substantially improved and new connections between the expressway network would be provided.

8. Town Hill Historic District

This residential area was placed on the National Register of Historic Places in May, 1973. The area includes many 19th Century houses, some 18th Century buildings and the John Harvard Mall. The proposals for improvement in the North Area do not affect any of the property within the Historic District.

9. Community College

Bunker Hill Community College opened its doors in 1973. While it is intended primarily as a commuter facility and students are encouraged to use rapid transit and buses,

parking facilities are included in plans for future development. The principal area for new parking is located on a site south of the Prison Point Bridge, immediately adjacent to the I-93 viaduct and Rutherford Avenue.

10. Commuter Rail Improvements

The MBTA expects a substantial increase in rail commuter usage in the 1980's. Therefore, improvements will be made to the system, including: completion of purchase of the existing B&M rights-of-way and the yards north of the River, upgrading of railbed and equipment, improvements at North Station. Plans for possible new uses in some of the rail yard property are being studied.

II.E EXISTING TRANSPORTATION SERVICE

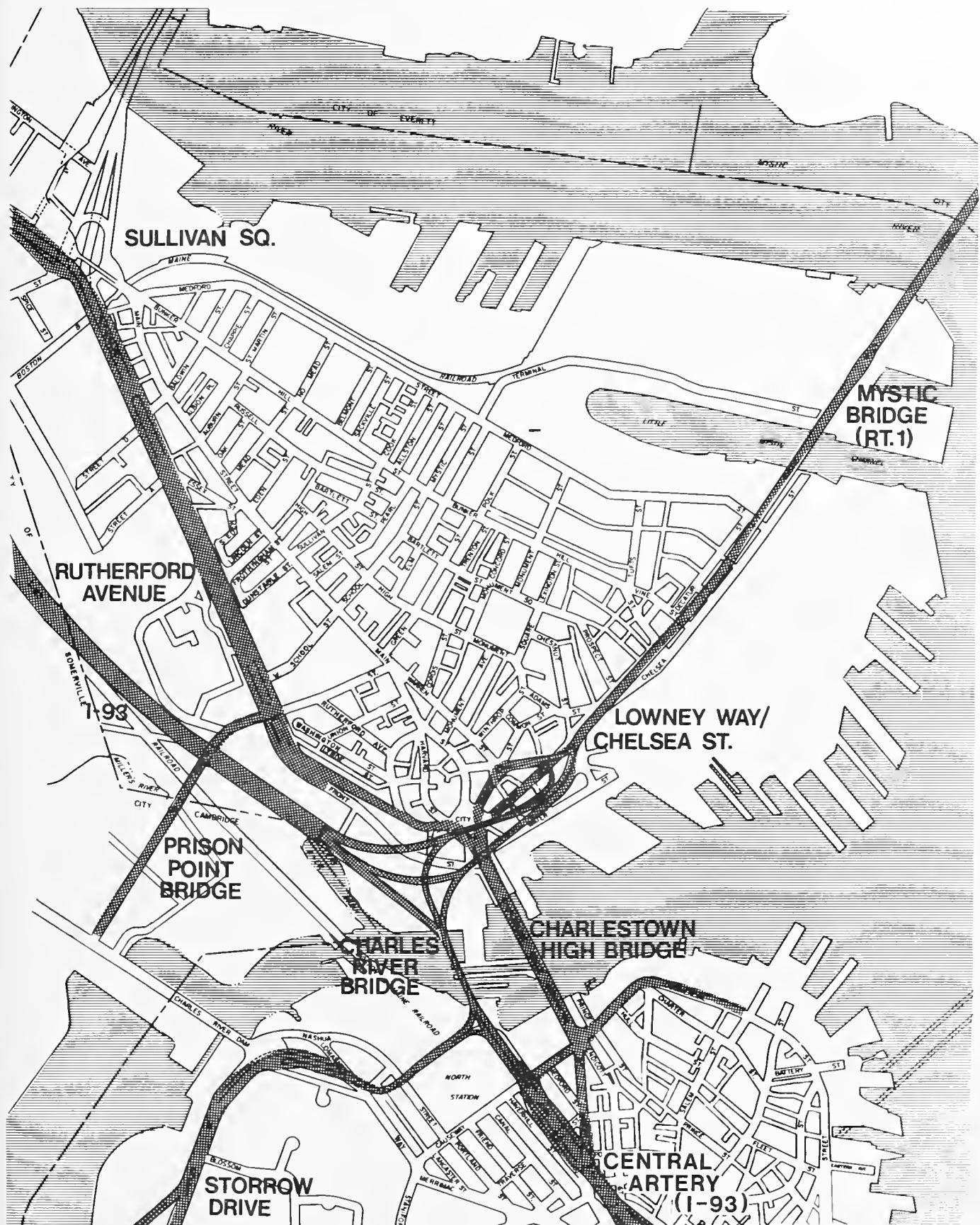
II.E.1 Regional Expressway System

A number of the region's major radial expressways converge in Charlestown and offer the potential for good regional access. The I-93 expressway is a high speed route from the northwest which extends to the outlying population centers in the region. The Tobin Bridge and its connections to the Northeast Expressway, Route 1 and I-95, provide a direct route to the north and northeast (via Route 128). The Massachusetts Turnpike and the Southeast Expressway offer regional access via modern facilities from the west and south through connections to the Central Artery and Tobin Bridge approaches.

Additional auto access from the west is available over Storrow Drive-Soldiers' Field Road. All of these routes converge just south of the Shipyard with services concentrated on the City Square ramp system. The Charlestown and Prison Point Bridges, while not tied directly to the regional expressway system, do provide access routes from portions of Somerville, Boston, and Cambridge.

II.E.2 Charlestown Circulation System

The streets which now serve the Charlestown community spread out in a general east-west fan shape from Sullivan Square at the center of the fan. Main Street, Warren Street, Bunker Hill Street and Medford Street form the backbone of this arterial system and serve the bulk of locally oriented traffic. Each of these three streets carries two lanes



**REGIONAL HIGHWAYS AND
MAJOR ARTERIALS**

FIG. II-3

of moving traffic (one in each direction) and provides the abutting properties with continuous access and a considerable amount of curb parking. During the afternoon peak periods traffic volumes range from 350-550 vehicles depending upon the street and location. (A traffic distribution map for the existing condition will be found in Chapter V.) The volumes are lower at the Sullivan Square node than at the easterly nodes, an indication of the downtown to Charlestown commuter pattern. The recent demolition of the MBTA elevated structures on Main Street has made a significant improvement to the level of traffic service on Main Street.

Traffic circulation in the north-south direction is hindered by the lack of a continuous route across the Charlestown community. For the most part traffic movements oriented in this direction now use Chelsea Street and Lowney Way along the easterly edge of the residential community and then penetrate these areas via Bunker Hill or Medford Street. This route is narrow and indirect and now carries 310-470 vehicles in the afternoon rush hour. Circulation along Lowney Way, Chelsea and Medford Streets is further compounded by the presence of heavy trucking.

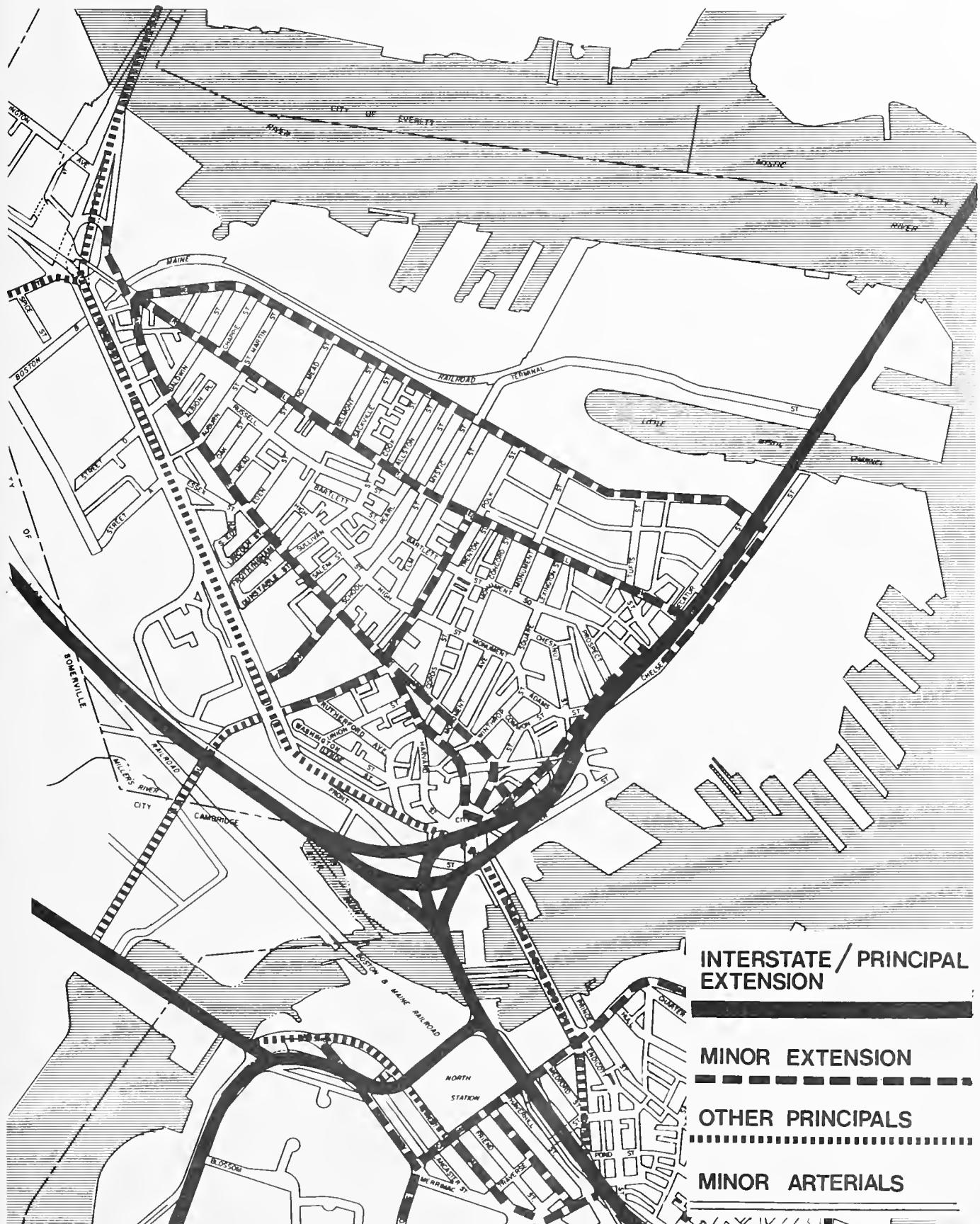
II.F EXISTING PROBLEMS

II.F.1 Expressway System

Traffic operations in Charlestown are characterized by: heavy through traffic along the periphery of the community on Rutherford Avenue, Interstate 93 and Tobin Bridge, congestion of arterial and expressway traffic within City Square, substantial numbers of trucks on much of the arterial street systems.

By far the most critical problem in the North Area is the Central Artery (I-93) truss bridge over the Charles River and the ramps carrying traffic to and from it.

The bridge, which is 650+ feet long and only 6 lanes wide, carries traffic between I-93 and Downtown Boston which must weave into traffic from the Mystic Bridge and Leverett Circle. The volume of traffic involved cannot perform this maneuver at desirable operational levels in the restricted



**FUNCTIONAL CLASSIFICATION
OF ROADWAYS**

FIG. II-4

space available. Traffic queues from the Central Artery Bridge on all approaches, restricting the useful capacity of all facilities entering into it. This is particularly critical during morning and afternoon peak hours when queues approach and often times exceed 1.5 miles in length.

Both the north and south ends of the truss bridge form major forks. The north forms the fork of I-93 and Route 1, Mystic Bridge, while the south side forms the fork of I-93 and the Storrow Drive ramp system. Sub-standard geometrics foster multiple entry and weaves resulting in both rear-end and angle-type collisions.

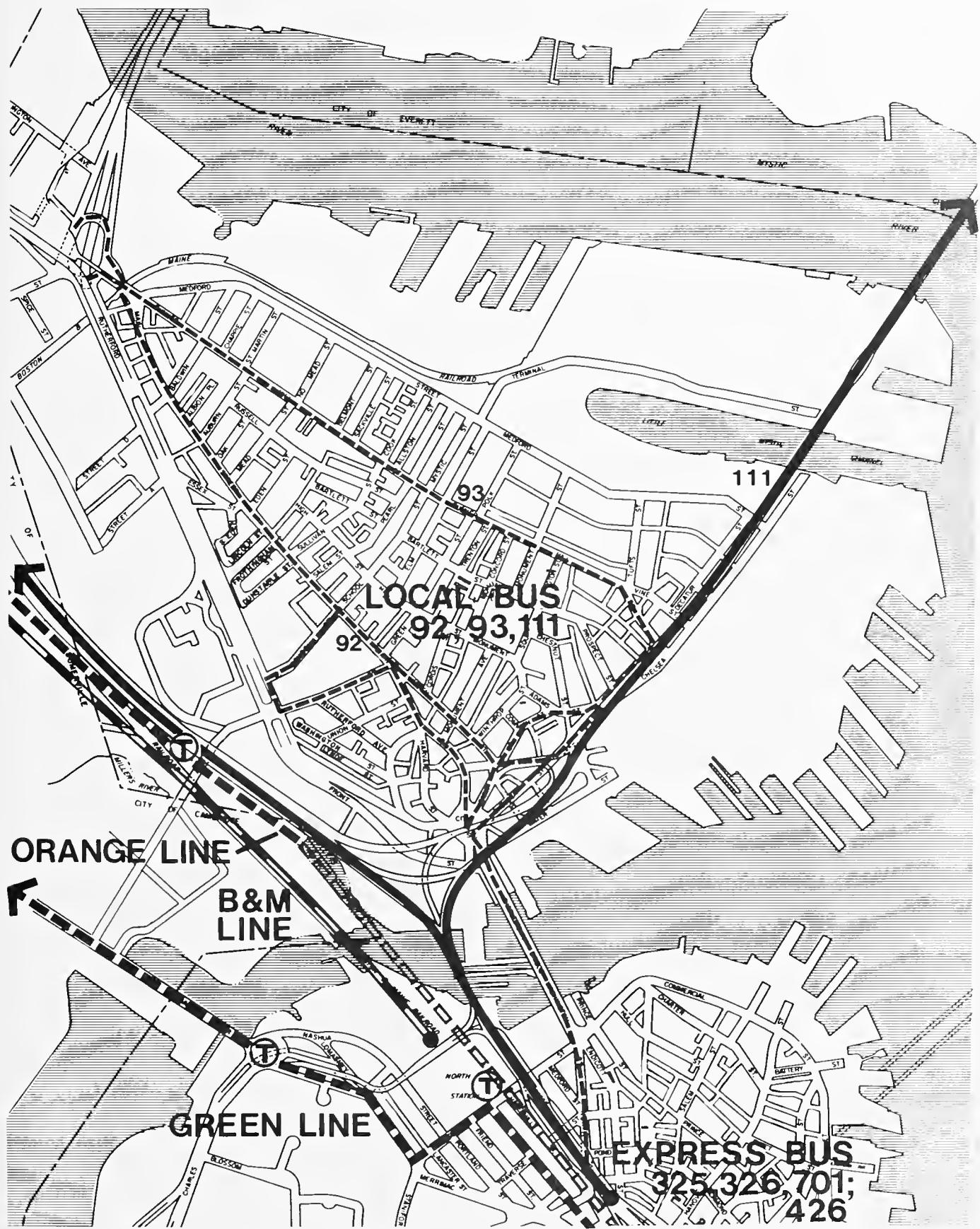
II.F.2 Surface Streets

Within the context of traffic circulation, access and safety, the Charlestown arterial street system exhibits the following problems:

1. lack of a good crosstown route
2. poor access to the northern end of the Shipyard and the Moran Terminal
3. inefficient traffic operations in City Square due to the complexity of the entering streets
4. lack of an effective signalization-channelization scheme.

II.F.3 Regional Transit Service

A number of the region's transit facilities pass through the North Area as they connect the core area with suburbs to the west, north and North Shore. The commuter rail lines serving North Station converge in the Boston and Maine rail yards before going into North Station. These include the Eastern Division, serving the North Shore, the Reading and Lowell Line serving the northern suburbs, and the Fitchburg and Bedford Lines serving the west and northwest suburbs. The MBTA Orange Line offers rapid transit service between the study area and downtown Boston. The Orange Line extends from Malden, the northern terminus at present, to Forest Hills, the southern terminus. Express bus service to the north and North Shore uses I-93 and those using the Mystic River Bridge go through City Square from the Haymarket terminal.



**REGIONAL AND LOCAL
TRANSIT SERVICE**

FIG. II-5

II.F.4 Local Transit Service

Local service in the North Area is provided by the MBTA Orange Line rapid transit with three stations in or near the North Area - Sullivan Square, Community College and North Station. All bus service in the area is provided by the MBTA. The area is served by three bus routes: Routes 92, 93 and 111. All three routes provide connections between City Square and Downtown Boston. Routes 92 and 93 also provide local service within the area.

II.F.5 Operational/Ridership Characteristics

Commuter rail service emphasizes peak hour trains, serving the outlying suburbs for primarily downtown-related trips. There is no service provided within the North Area; the closest location for access is North Station. Free transfer can be made from these commuter rail lines and the rapid transit network.

The Orange Line provides frequent service during the rush hours, with train headways of 4 1/2 minutes. Mid-day headways are 7 to 8 1/2 minutes, while evening service has a 13 minute headway. Fares on the Orange Line are 25¢ to all stations except Malden. There is no free transfer between rapid transit and buses.

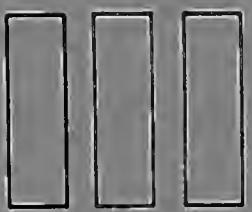
Frequency of bus service varies, as described in Figure II-6. All bus fares are 25¢.

Figure II-7

Selected Operating Characteristics of North Area Bus Routes

Bus Rte. No.:	92	93	111
Bus Rte. Name:	Sullivan- Haymarket	Sullivan- Haymarket	Woodlawn- Haymarket
	via Main	via Bunker	Hill
Weekday Headways:			
Peak Period	15	7½	7
Mid-day	30	20	15
Evening	30	30	25

IDENTIFICATION AND DEVELOPMENT OF ALTERNATIVES





CHAPTER III. IDENTIFICATION AND DEVELOPMENT OF ALTERNATIVES

III.A SPECIAL CONSIDERATIONS

A number of factors special to the area of the proposed action have heavily influenced the conceptual approach and design of the alternatives and are listed in following sections.

III.A.1 Transportation Objectives

Following are the transportation objectives for North Area improvements:

1. improve expressway operations
2. reduce accidents
3. reduce congestion and delays
4. improve pedestrian access
5. define a useful and acceptable project
6. make plans compatible with other improvements

III.A.2 Community Objectives

The objectives that have been identified to date from meetings with the community include some of the transportation objectives above and other community concerns:

1. improve local street operations
2. reduce accidents
3. reduce congestion and delays
4. remove aerial ramps
5. provide full access to expressways
6. minimize trucks on local streets
7. provide pedestrian access to the waterfront and City Square
8. better land use around City Square
9. recognize historic importance of City Square
10. involve the community in all City Square improvements
11. improve local street access to and from City Square
12. provide for public safety vehicles in local street plans
13. improve MBTA service
14. employ Charlestown residents in construction work

III.B CRITERIA FOR THE DEVELOPMENT OF ALTERNATIVES

The Alternatives described in Chapter IV have been developed to meet the objectives above. In addition, the alternatives are limited by these physical conditions: land use, land available for improvements, engineering requirements and design considerations.

III.B.1 Land Use

Charlestown was originally a peninsula, which developed with residential uses from the tops of the hills to the waterfront. Gradually industrial and transportation uses were developed around the perimeter of the residential community. Over time industries have expanded or disappeared, and additional transportation facilities were built, including I-93, the Mystic Bridge and Rutherford Avenue. The transportation facilities have had a limiting influence on additional land development, and have also restricted development on some parcels adjacent to their rights-of-way.

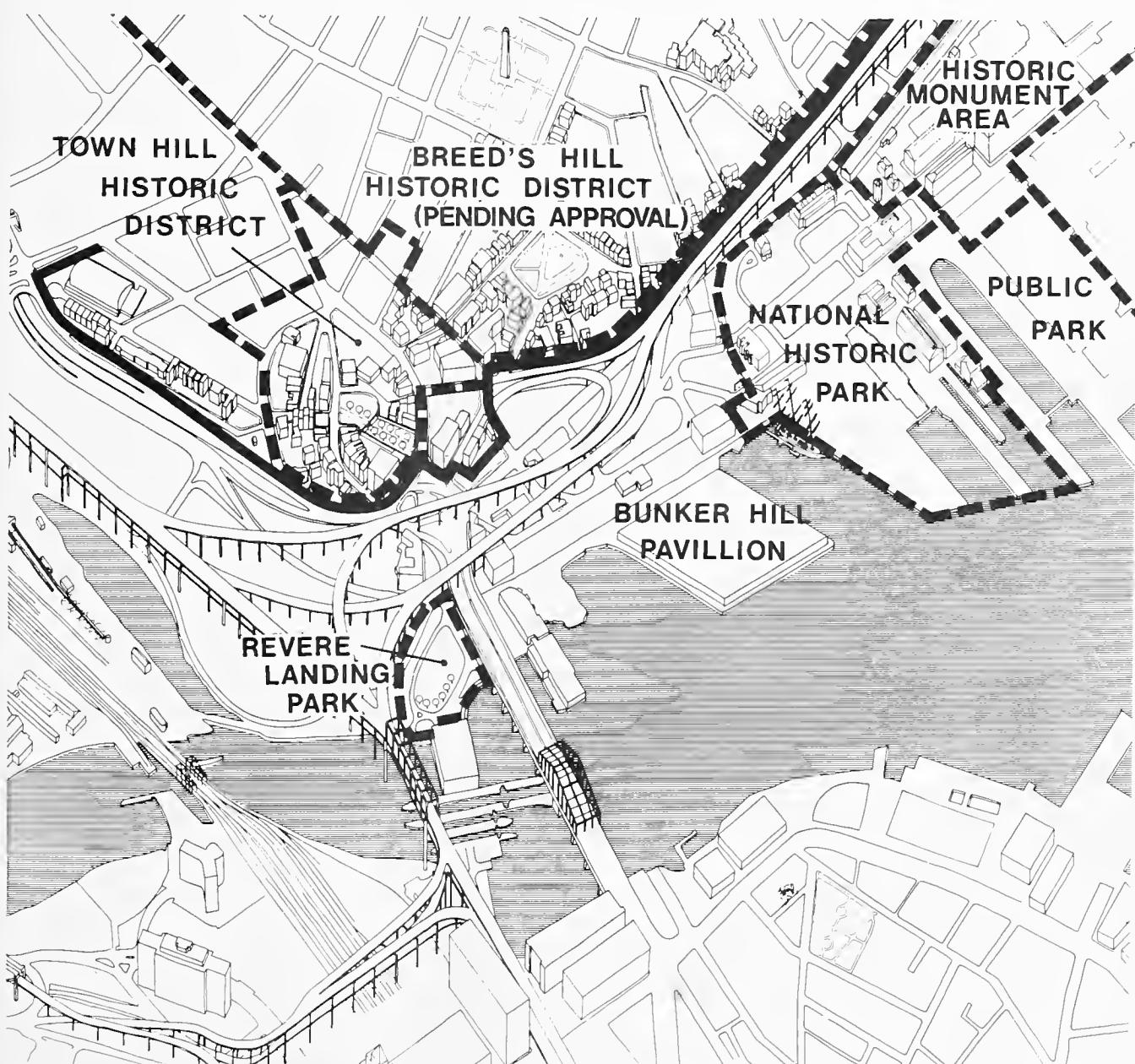
As a result, substantial amounts of vacant land exist in the City Square area, extending along Rutherford Avenue and the approaches to the Mystic Bridge. There is a well defined boundary of residential uses which must be respected as a constraint on the physical design and impacts of traffic resulting from any changes in the transportation facilities in the area. Other constraints are the new uses being planned and developed in the Navy Yard, including the National Park and community open space, and the Paul Revere Landing Park which is being constructed adjacent to the new Charles River Dam.

III.B.2 Land Available for Improvements

Between the residential area and the parks along the Charlestown waterfront, there is a substantial amount of vacant land. In this area, transportation improvements may be feasible because the present transportation facilities detract from adjacent lands and make them unattractive for other uses. In addition, the land that is vacant or used for existing transportation facilities provides sufficient area for extensive improvements without taking land away from the

residential community or parks. Further, the lands can be used not only for transportation improvements, but may also be available for new uses which the community may desire.

The area west of Rutherford Avenue is also largely vacant up to the existing I-93 viaduct. This area has also not been developed, despite urban renewal efforts, and this is largely due to the negative influence of the highway structure. The land to the west of I-93 in Cambridge is a former rail yard area,



LOCATION CONSTRAINTS

FIG. III-1

now being used for warehousing, storage, and a concrete plant. These land uses are compatible with proposed improvements. Figure III-1 shows location constraints on land available for alternative transportation improvements.

III.B.3 Engineering Design Considerations

As previously noted, I-93 in the North Area has been identified as the highest accident location on the state highway system. The accidents are a direct result of the sub-standard geometrics of the highway. Operational problems are focused on the Charles River Bridge where two major expressways (I-93 and Route 1) meet and traffic must merge and weave on the three-lane, 650±-foot section.

The following criteria have been used in developing alternatives for North Area improvements:

1. significantly reduce the number of accidents on the interstate and entering roadways.
2. improve the flow of traffic throughout the North Area
3. update design standards by introducing into an improved design acceleration and deceleration lanes, adequate shoulders for safety and breakdowns, improved horizontal and vertical alignment, and improved sight lines.
4. improve traffic flow on local streets with a resultant reduction in accidents.
5. improve access to the expressways from Charlestown.
6. optimize design features in order to return maximum benefits for capital outlay
7. minimize disruption, dislocation and other social and economic costs which may be associated with construction of the project.

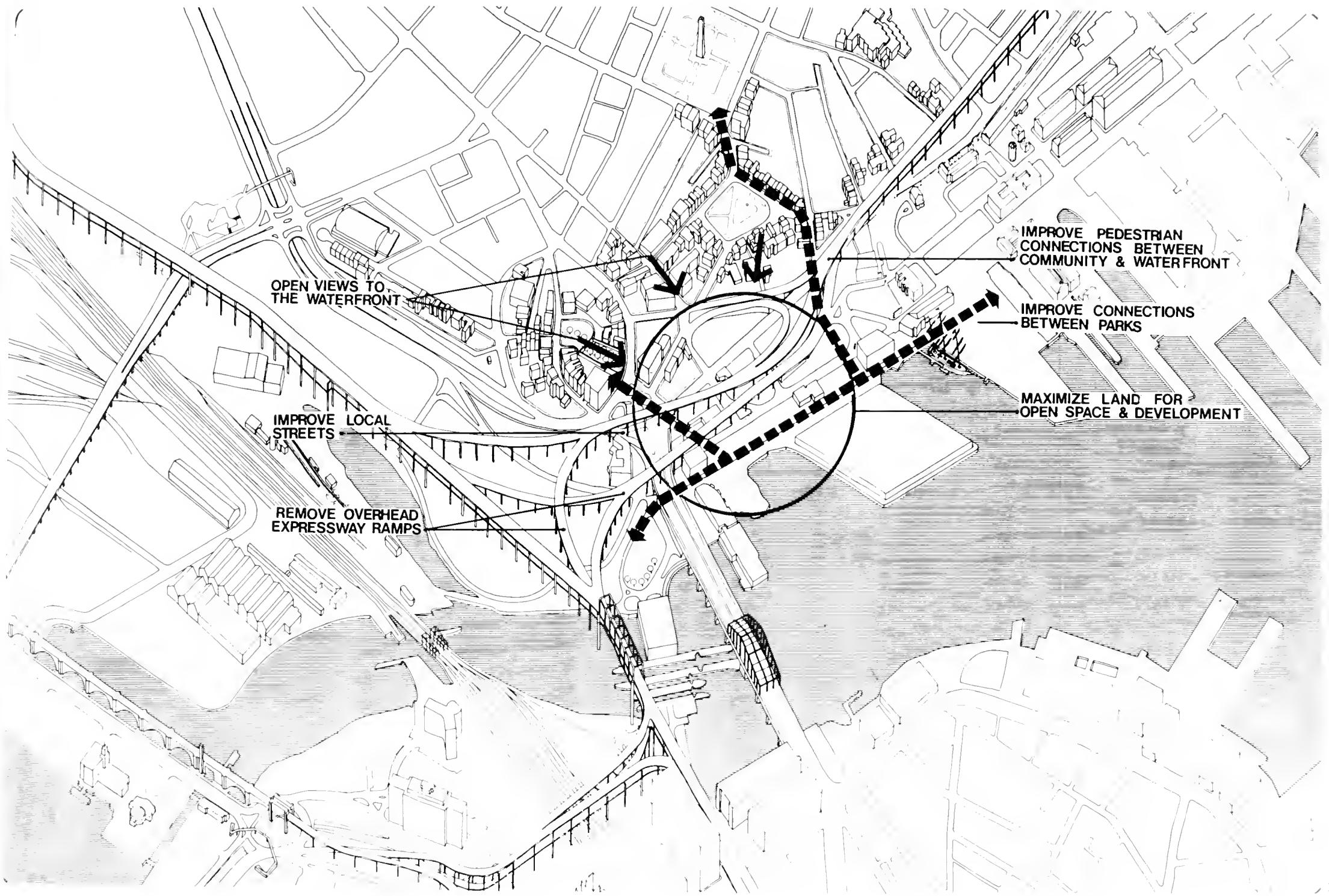
III.B.4 Urban Design Considerations

In addition to engineering requirements, environmental and community concerns have been recognized in the development of alternatives for North Area transportation improvements and related land use changes. Following are the specific design considerations that have been used:

1. providing local street improvements which enhance present and proposed development in the community
2. minimizing impact of expressway interchange on City Square, including removing, where possible, the interchange and overhead structures from City Square.
3. providing opportunities for development which is compatible with the scale and character of existing and proposed land uses in the community.
4. maximizing land available for community use adjacent to proposed transportation facilities.
5. opening new options for waterfront use, including the proposed greenbelt along the Charles River, and connections between parks at the harbor's edge.
6. improving pedestrian connections between the community and the waterfront.
7. improving views between the community and the waterfront.

Figure III-2 is a diagram of the above urban design considerations.

URBAN DESIGN CONSIDERATIONS







DESCRIPTION OF ALTERNATIVES



CHAPTER IV. DESCRIPTION OF ALTERNATIVES

IV.A. ALTERNATIVE 1 - The No Build

This includes replacement of decks to maintain the existing facility and to provide added years of service should no other



ALTERNATIVE 1: NO BUILD

FIG. IV-1

improvements be made. The No Build alternative includes:

1. rehabilitation of the Mystic Bridge/I-93 viaduct ramp system. Replacement of those viaduct decks opened to use in 1959 is anticipated to be necessary within the next 10 years if no other major reconstruction is to be undertaken.
2. because such improvements may cause serious disruption to the North Area, additional measures may need to be taken to assure continuous traffic movement in the area during the rehabilitation period.

IV.A.1 Traffic Patterns and Routes

The No Build alternative would not physically change existing traffic patterns. However, it would have an effect on surface roadways within the corridor because of the limited capacity of the present Charles River crossings.

It is expected that there will be a continued and increasing demand for traffic to pass through the North Area for access to and through downtown Boston, particularly as I-93 is the only north/south major facility in the metropolitan area. In addition, there are also traffic generators in the North Area which are expected to add to the volumes of traffic using transportation facilities in the North Area. These include the National Park, the Moran Terminal, and the possibility of intense development at the north end of the Navy Yard. As these new traffic generators open, and as downtown continues to attract traffic, volumes would increase to capacity and beyond. The extreme delay and congestion would force motorists to seek other routes. The amount of through traffic in City Square can be expected to increase substantially as motorists get off expressways to avoid the congestion. As demand increased, traffic would further infiltrate local streets and the rush hour would lengthen to 2 to 3 hours. Traffic projections are based upon the continued demand for traffic to pass through the North Area for access to and through downtown Boston.

IV.A.2 Capacity

The No Build Alternative would cause traffic capacity to be frozen at approximately the existing levels. Introduction of additional traffic in the North Area would result in a further lowering of the level of traffic service with corresponding increases in congestion and delay.

IV.A.3 Construction Cost

The construction cost for the No Build alternative, which includes only the essential reconstruction of the expressway decks is currently estimated to be 5.6 million dollars.

IV.B. ALTERNATIVE 2

Alternative 2 provides improved facilities in the North Area beyond the minor modifications of the No Build Alternative. The major features of Alternative 2 are:

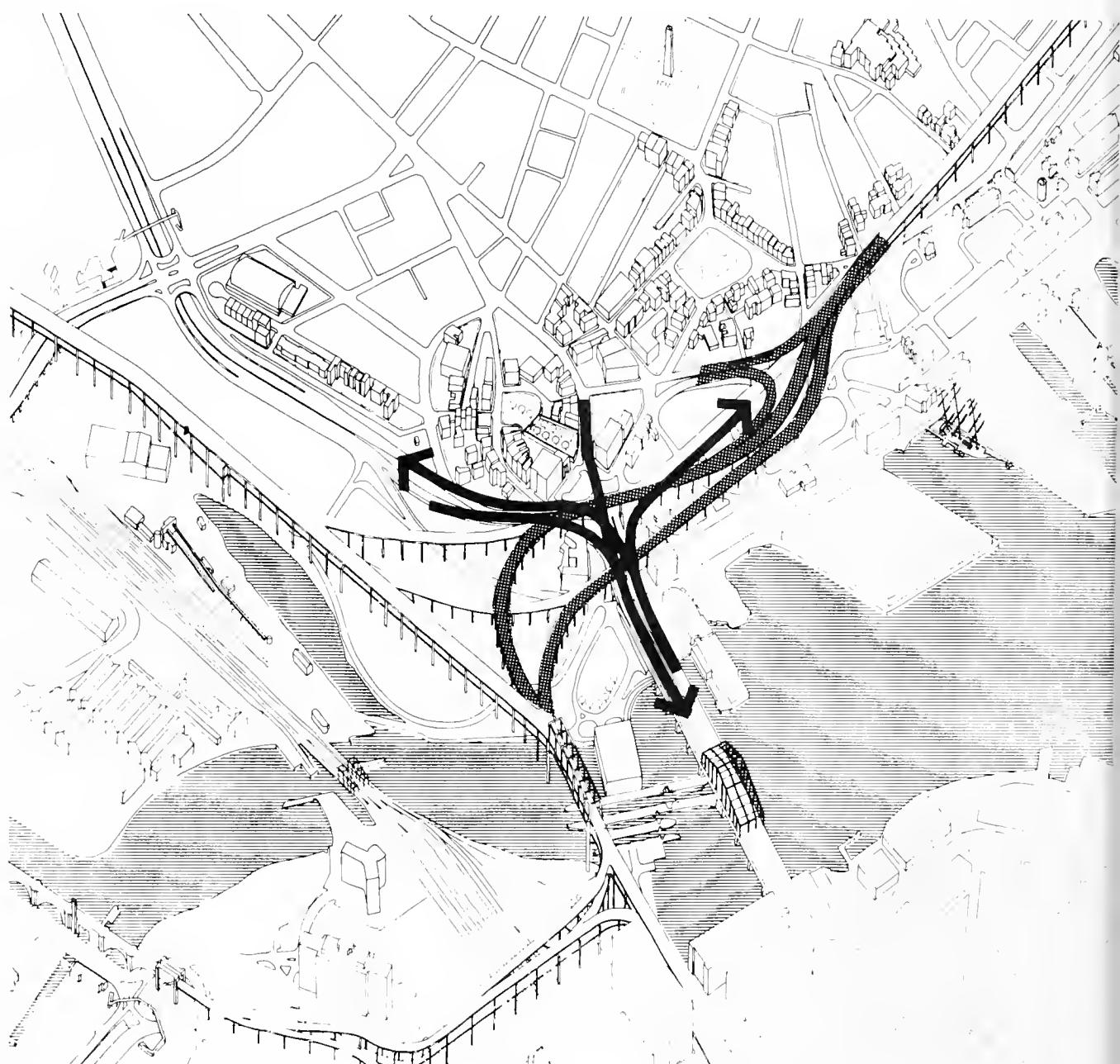
1. Rehabilitation of the Mystic Bridge/I-93 viaduct ramp system as in Alternative 1.
2. Major reconstruction of surface streets and arterials in the vicinity of City Square, using options previously developed by the city and the state.

IV.B.1 Surface Street Options

Three options have been discussed by the city, state, and community over the past several years. Options use existing streets and work with the constraints provided by the supporting columns of the overhead structures and also avoid taking any buildings from the North Area to effect these improvements. They have been designed to correct the present deficiencies of the street configuration in the City Square area and are compatible with existing or proposed street improvements in the vicinity, such as New Rutherford Avenue and the proposed Water-Chelsea Streets connection. The options emphasize improved arterial street operations, while at the same time providing improved local access between arterials and collection/distribution streets.

Surface Street Scheme H provides for full connections between all major arterials in the City Square area, as well as all local streets. It connects new Rutherford Avenue with the Chelsea Street, and the

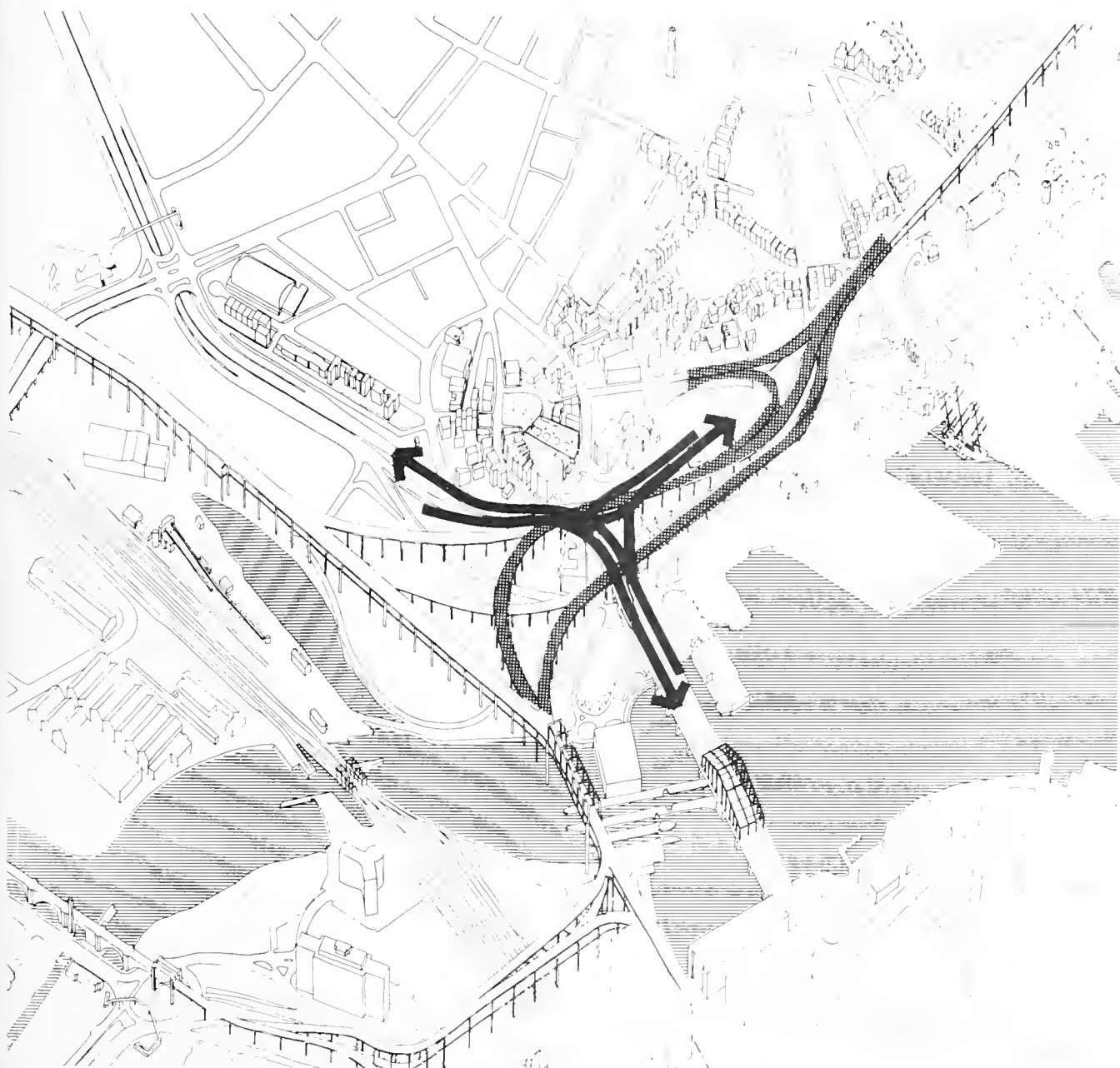
Charlestown Bridge with the one-way pair of Main and Park Streets. In addition, it provides a lane for direct access from new Rutherford Avenue southbound to the Charlestown Bridge. Because of these changes, the City Square open space is reshaped and a parking area is added in front of the court house. Other landscaped areas can be added if desired. This option gives the maximum local traffic service into and through the Square.



ALTERNATIVE 2: "H" SCHEME

FIG. IV-2

Surface Street Scheme T emphasizes the connection between the Charlestown Bridge, Rutherford Avenue, and Chelsea Street. It does not have the full range of connections to local streets in City Square, but provides for these connections from arterials outside of the Square. Main and Park Streets are made into a one-way loop which does not connect directly with other streets in the Square. Traffic from the Joiner Street ramps is routed into the square via an intersection with Chelsea Street. This

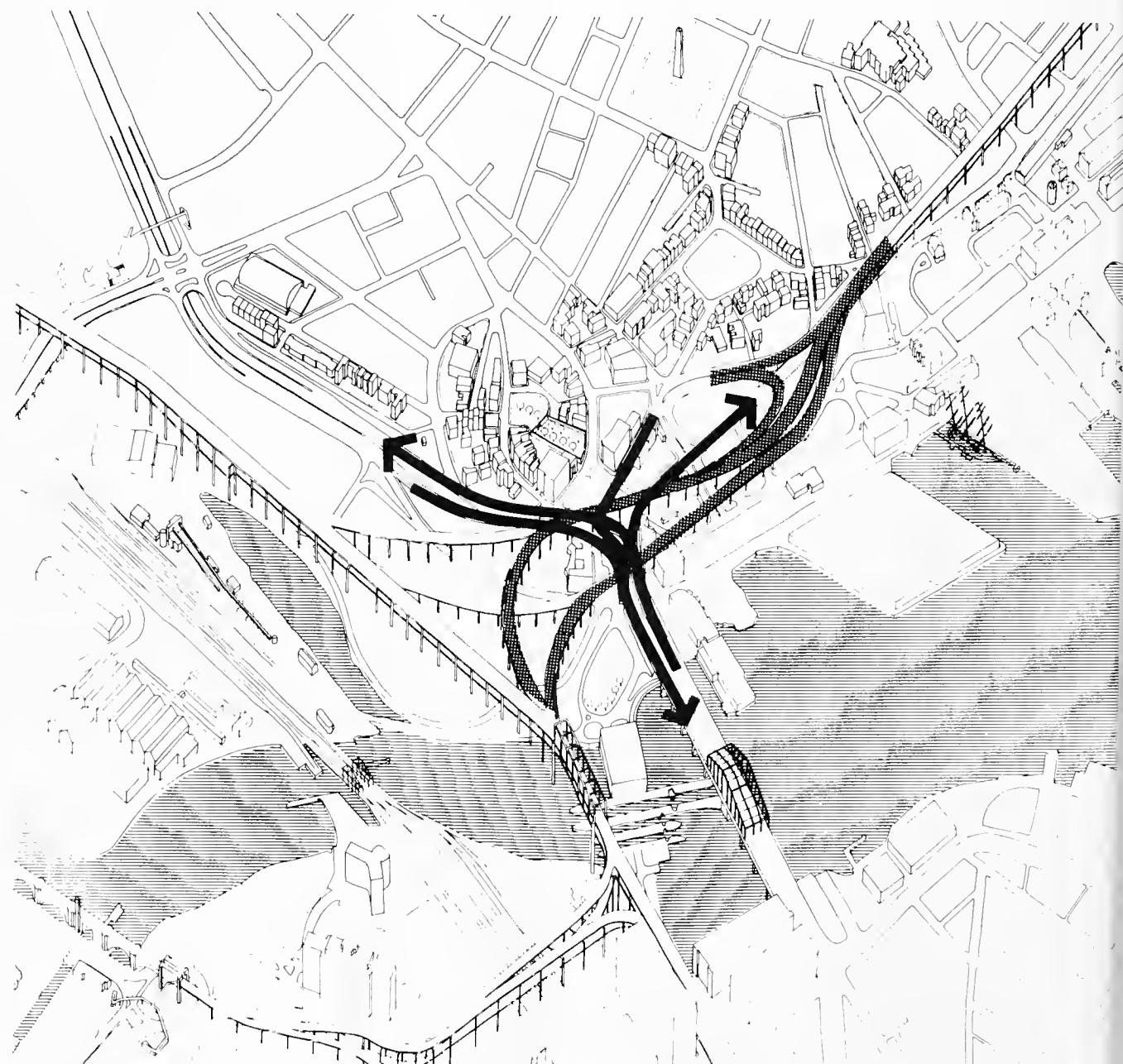


ALTERNATIVE 2: "T" SCHEME

FIG. IV-3

option has more open space than the H scheme because of the closing of Main and Park Streets. It also allows a parking area in front of the court house, along with several other small landscaped areas between roadways in the Square.

Surface Street Scheme M connects all the major arterial and local streets in the City Square area. It has direct connections between New Rutherford Avenue and the Charlestown Bridge. Park and Chelsea Streets



ALTERNATIVE 2: "M" SCHEME

FIG. IV-4

form a one-way pair between the Square and Joiner Street ramps. Access from New Rutherford Avenue to the waterfront is provided by Front Street and uses Water Street as the main access to the Navy Yard and eventually the Water-Chelsea Street connection. A complete separation of traffic movements in the Square is included with one traffic signal for left turning movements from the Joiner St. ramps to the Charlestown Bridge. The Bridge connecting to N. Washington Street has four lanes inbound and two lanes outbound. Parcels of land in City Square are designed to leave two square areas for open space. Parking is also provided in the front of the Court House and the YMCA.

IV.B.2 Traffic Patterns and Routes

Alternative 2 would not change the existing expressway ramps and traffic patterns. Decks would be rebuilt, but without any alterations to the traffic carrying or service capabilities. This would have an effect on future conditions because of limited capacity to handle future demand. Traffic projections are based on continued demand for traffic to pass through the area for access to and through Downtown.

New surface schemes would improve movement through City Square. The traffic patterns and routes for each of the surface options are as follows:

Surface Street Scheme H has direct connections from the Joiner Street ramps through City Square to the Charlestown Bridge. It uses Main and Park Streets as a one-way pair for this movement. Traffic on Main and Park Streets is expected to increase. These two streets have a major intersection with New Rutherford Avenue and Chelsea Streets. While southbound traffic on Rutherford Avenue has free-moving access to both Water Street and the Charlestown High Bridge, traffic northbound to Rutherford Avenue must make a left turn in the Square. This move is expected to be a heavy flow, because it also provides the main access from the Navy Yard to both Rutherford Avenue and the Charlestown Bridge. Access from the Navy Yard to the Mystic Bridge is direct via Joiner Street, while access from the Mystic Bridge to the Navy

Yard must pass through the Square via Henley, Main and Chelsea Streets. Columns supporting the overhead expressway structure would remain in the Square and would interfere with the safe and effective flow of traffic.

Surface Street Scheme T has access from the Mystic Bridge via Joiner Street to Chelsea Street into the Square. This movement requires a left turn for access to the Charlestown Bridge, which would cross traffic in the triangular pattern formed by the intersection between New Rutherford Avenue, the Charlestown Bridge, and Chelsea Street. Traffic southbound on New Rutherford Avenue must cross the center of the Square to connect with Chelsea Street, while traffic bound to the Charlestown Bridge and Water Street has a direct free-flowing move. Northbound traffic from the Charlestown Bridge must pass through the Square and make a left turn on Rutherford Avenue, and traffic to the Mystic Bridge uses Chelsea Street. The major point of conflict in City Square is caused by the left turns from the three major streets that meet in the Square. Main and Park Streets which are one-way in this scheme do not have a direct connection into the Square.

Surface Street Scheme M is a variation of the T Scheme. Like the T Scheme it provides for the major connection between Rutherford Avenue and the Charlestown Bridge. However, two streets - Park and Chelsea - serve the same function that Chelsea Street alone does in the T scheme. The major left turn from southbound Rutherford Avenue to Chelsea Street has been eliminated, and is replaced by Front Street leading to Water Street. As a result, the intersections in the Square are less complicated. However, Park Street would have heavy traffic from the Joiner Street off-ramp and this traffic would have to make a left turn in the center of the Square for access to the Charlestown Bridge. Traffic from the Charlestown Bridge to the expressways would use Chelsea Street. Access from the Navy Yard to both Rutherford Avenue and the Charlestown Bridge would be via Joiner Street, with a left turn onto Park Street. This creates a major new intersection at Joiner and Park Streets and would increase

the traffic on Park Street. Main Street in this scheme is relatively minor, principally serving local access to the Square.

IV.B.3 Capacity

Alternative 2 would provide no additional expressway traffic capacity. However, the overall capacity of the North Area would be marginally increased, because of improvements to the local streets in and around City Square. New street patterns would make the local street traffic more orderly and safe. However, retaining the Joiner Street ramps to the expressways and the support columns for the overhead expressway structure would both limit the effectiveness of the local street improvements and future expansion possibilities. New traffic generators for the North Area add traffic to local streets and limitations on their capacity would lead to increasing congestion and delay.

IV.B.4 Construction Cost

The construction cost for Alternative 2, including deck rebuilding and surface street improvements would be approximately \$7,500,000, depending upon the option chosen for the surface streets.

IV.C. ALTERNATIVE 3

The basic scheme for improvement to the Artery river crossing as developed by the MDPW provides for a new trumpet interchange to be constructed in the Boston & Maine Rail Yard area and over the commuter rail lines serving communities to the north of Boston and away from the congested portions of residential Charlestown. This will permit expressway traffic to interchange between the Artery (I-93) and the Mystic Bridge at a greater distance from the present Charles River Artery bridge. By lengthening the merge and weave distances and providing for merges on the right side of the Artery, the operation of the River Crossing bridge will be substantially improved. The Trumpet Scheme provides for the following improvements:

1. An improved interchange between expressways with greater distances between merging streams of traffic, adequate sight lines, acceleration and deceleration lanes, and construction in a par-

- tially vacant, partially industrial/railroad area.
2. Improved local access into the expressway network, with elimination of the present peak-hour restrictions on local ramps to the Artery. These access points can be designed to provide local access without interfering with the main stream of expressway traffic.
 3. Provision of tunnels under City Square, to allow removal of the aerial expressway structures in the area, and to provide for improvements to arterials and local streets at this intersection.
 4. Removal of the S-curve at the foot of the Mystic Bridge through the straightening of the Bridge approaches linking to the trumpet ramps.
 5. Retention of the existing Artery river crossing bridge and I-93 viaduct, and removal of all other aerial ramps in the City Square area.
 6. Reorientation of land uses to the straightened bridge approaches, the new City Square tunnels and the trumpet ramps and expressway access points.

City Square, in the trumpet scheme, is the location for two tunnels which allow expressway traffic to and from the Mystic Bridge to pass under local streets and arterials. The principal impacts on City Square traffic include:

1. The connection between Rutherford Avenue and the Charlestown Bridge can be straightened, as part of the overall project.
2. Rights-of-way for both bridge approaches and Rutherford Ave. are likely to include the present YMCA building.
3. Chelsea Street can become two-way and carry traffic as a major arterial serving the Naval Shipyard and the seaport areas. It will also serve as the major local access street to and from the Mystic Bridge.
4. Local street access through City Square can be designed to permit primarily local traffic access to this important node and to eliminate the need for through traffic to use local streets. Through improved access points and storage lanes, the access from Charlestown to the expressways will be substantially improved. The

ALTERNATIVE 3: EXPRESSWAY ELEMENTS

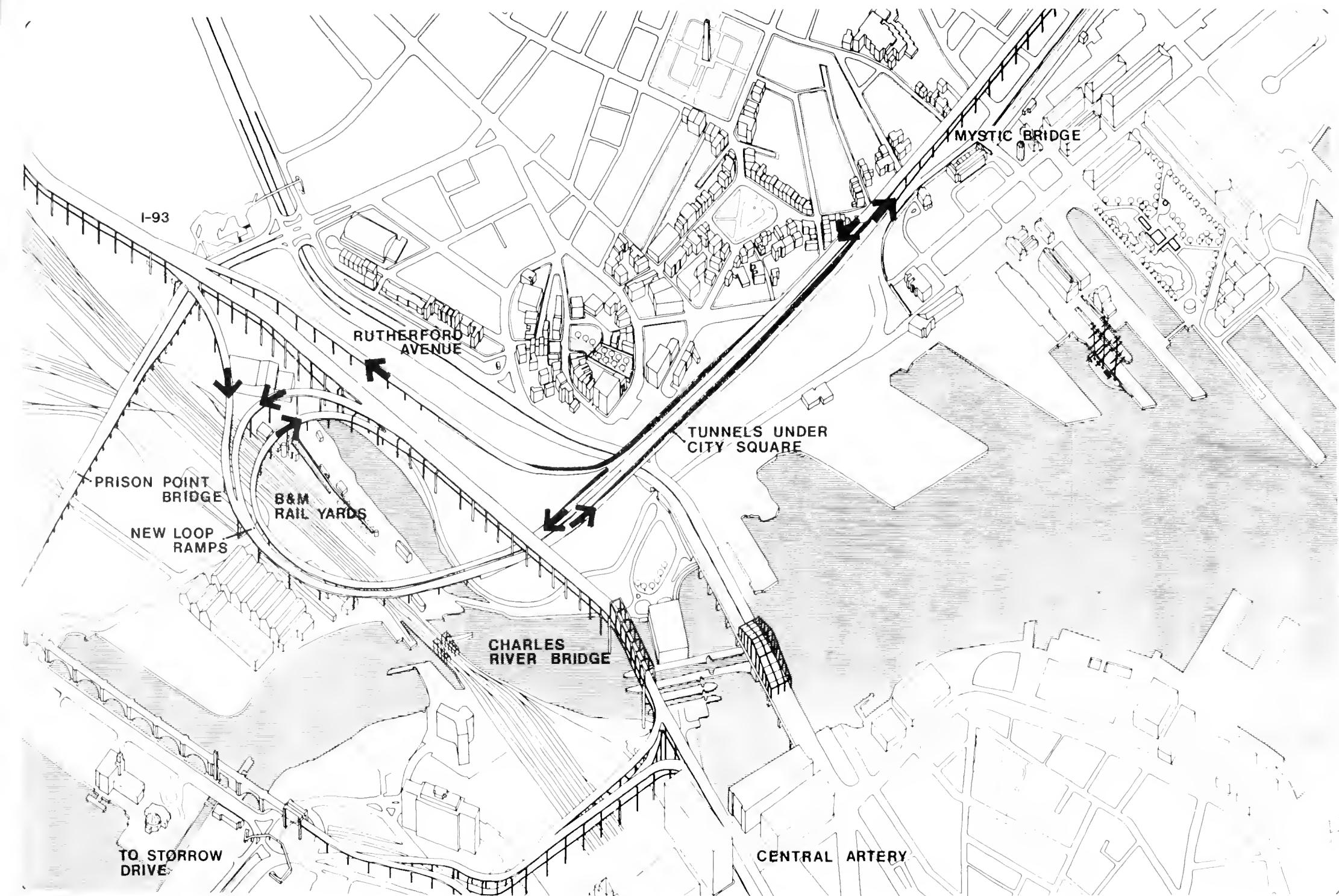
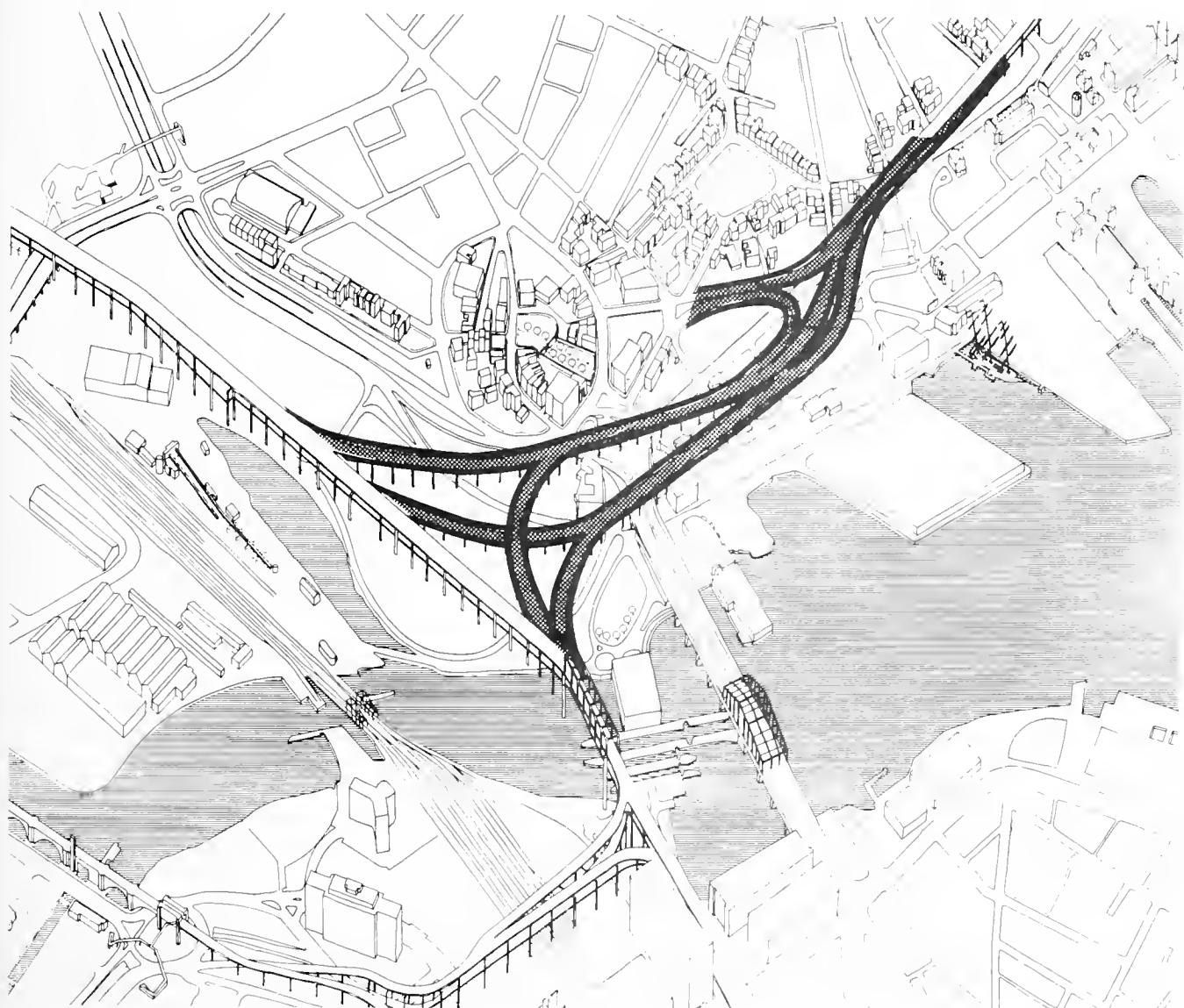


FIG. IV-5



new ramp access points would be located outside residential areas to eliminate heavy traffic moves on local streets.



RAMPS TO BE REMOVED - ALT. 3

FIG. IV-6

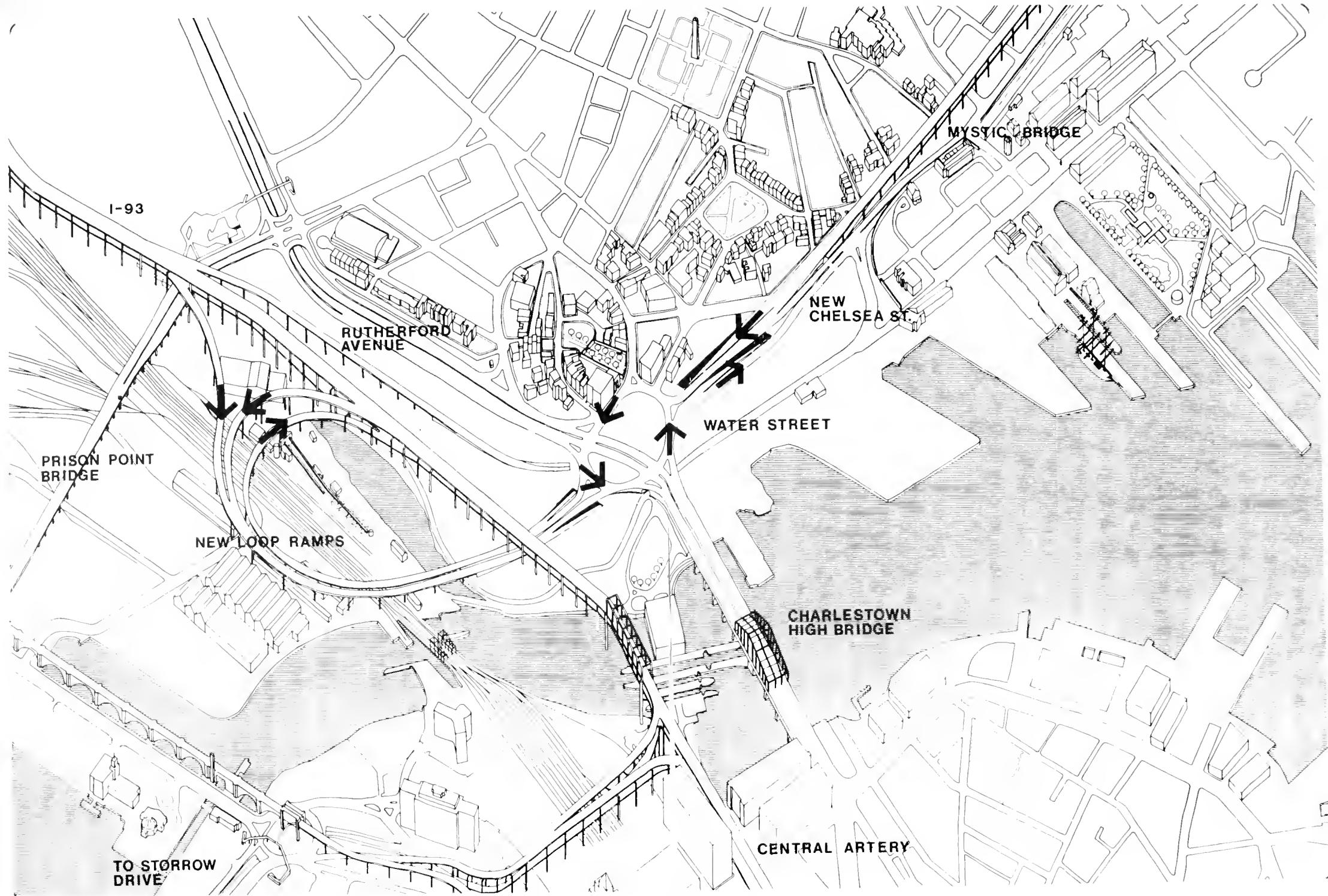
IV.C.1 Surface Street Options

Several options for surface street improvements which are compatible with Alternative 3 have been developed by the MDPW. The greatest opportunities for improving surface streets and traffic operations are possible because of the expressway tunnels under City Square and the removal of the overhead structures and ramps from the vicinity. All surface street options are compatible with the existing or proposed street improvements in the area, such as New Rutherford Avenue and the Water-Chelsea Street connection. A particular design for City Square will be identified in the final design of Alternative 3. This City Square design will be developed from input from the Charlestown Community and the City of Boston.

Surface Street Scheme A provides complete connections between all of the streets in City Square. It does this by a rotary for all connecting movements, and a through traffic connection between Rutherford Avenue and the Charlestown Bridge. Main and Park Streets will be the chief routes for access into the residential community. Traffic on Joiner Street will be substantially reduced because of the removal of the existing ramps as part of expressway improvements. Chelsea Street will become more major because it links with the Water-Chelsea Street connector, and will be the principal means of access to the Waterfront and Navy Yard development. Direct access to and from the Mystic Bridge and the expressways takes place from the rotary, adjacent to City Square. Surface Scheme A provides the maximum range of traffic connections because of the rotary; however this is at the expense of land use options. The major parcel in the Square will be open space within the rotary, although this will be difficult to use because of the surrounding street pattern.

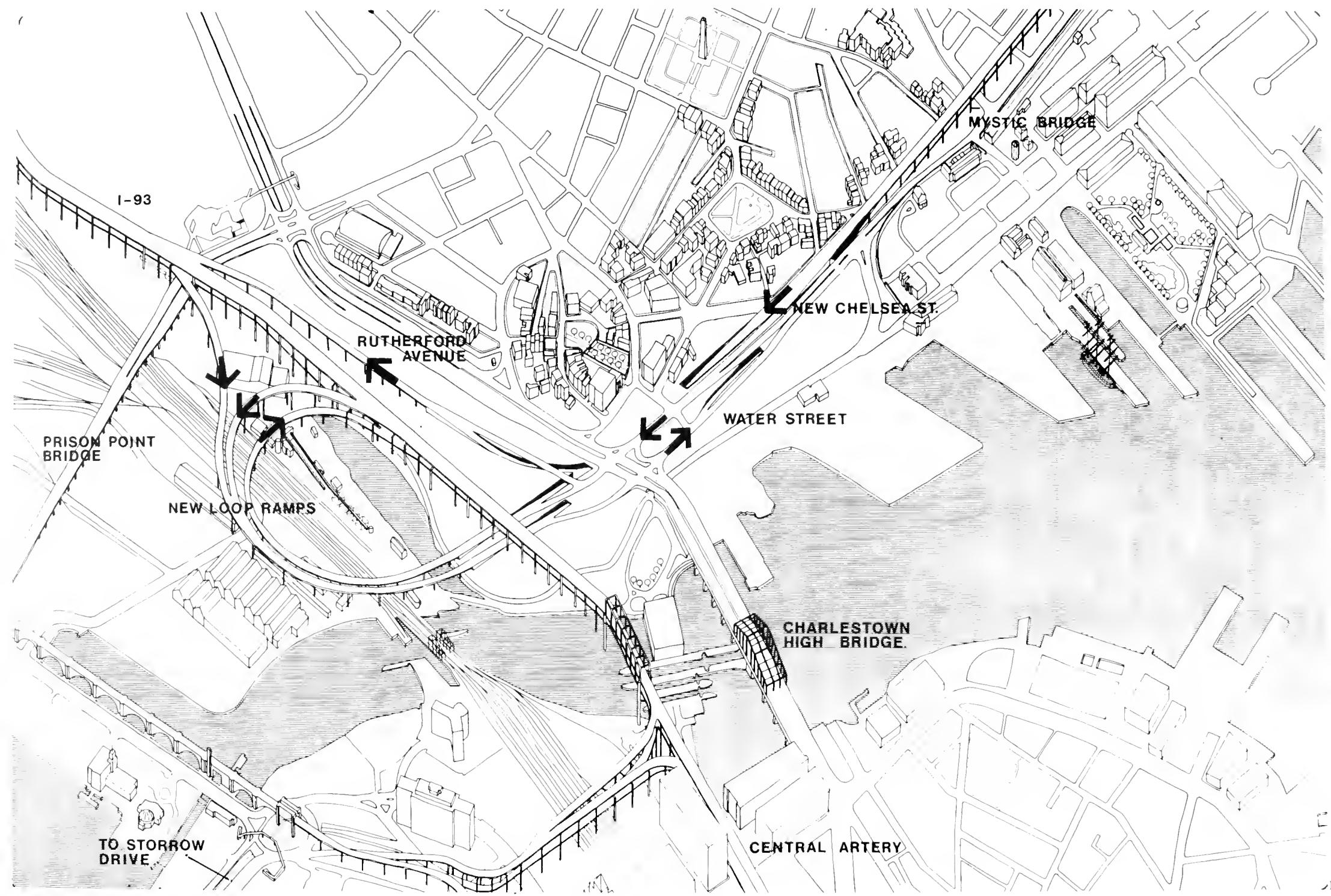
Surface Street Scheme B is a simpler intersection of arterial streets, with direct connections between Rutherford Avenue and the Charlestown Bridge, and Chelsea Street and the connections to the expressway ramps. Local street connections into the Square are less direct, in order to minimize traffic on community streets. Principal access into the residential

ALTERNATIVE 3: "A" SCHEME



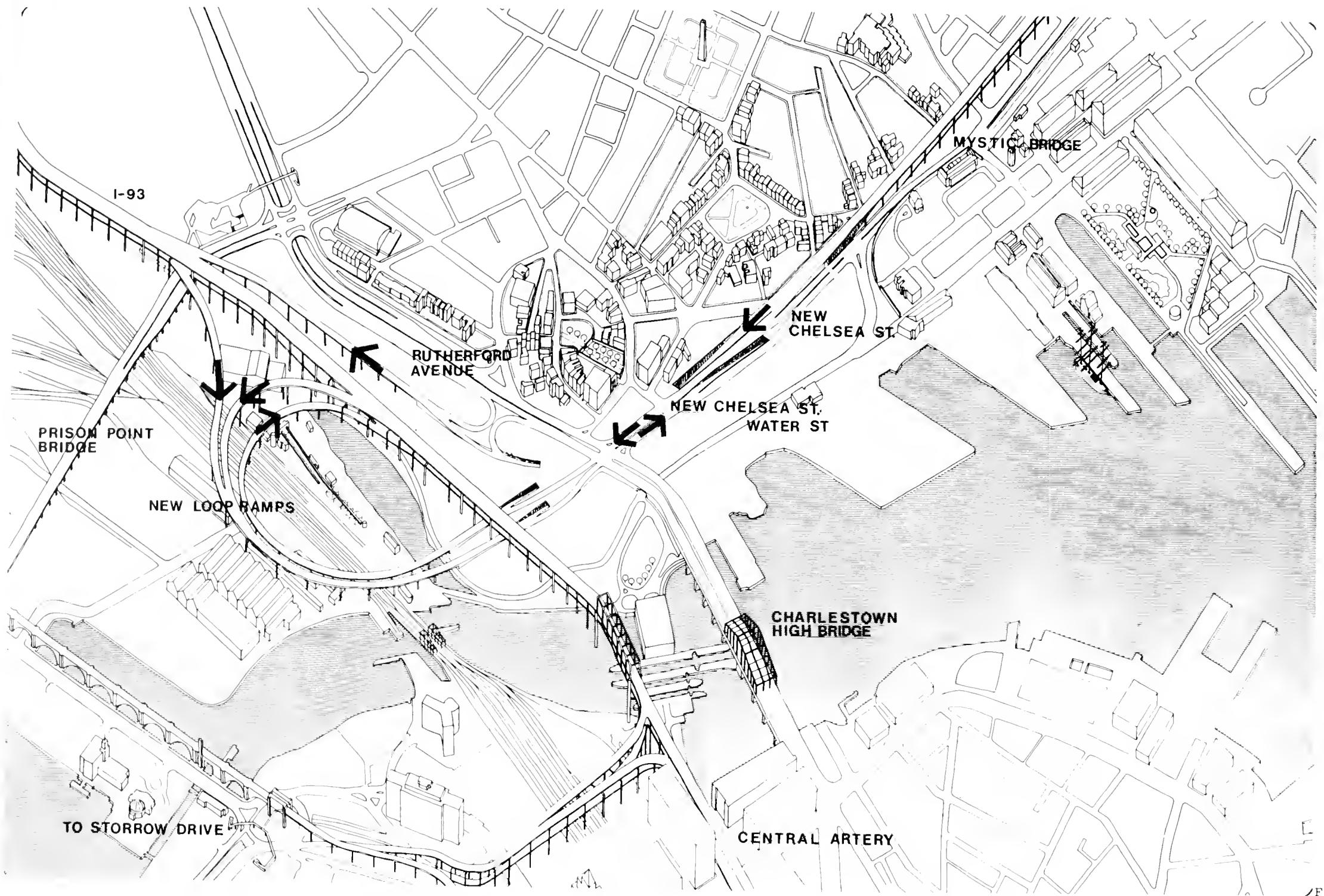


ALTERNATIVE 3: "B" SCHEME





ALTERNATIVE 3: "C" SCHEME





community is provided from Chelsea Street via a new street connecting to Main and Park Streets. All local access to and from the Mystic Bridge is via Chelsea Street. Other expressway access is from Rutherford and Chelsea at City Square.

Surface Street Scheme C is essentially the same as Scheme B, with the exception of the proposed alignment of Chelsea Street. Chelsea Street is moved closer to the tunnel alignment, to allow for better parcelization of land to be developed. Access from the Mystic Bridge to the Charlestown Bridge is via a new loop west of Rutherford Avenue.

IV.C.2 Traffic Patterns and Routes

Alternative 3 would create major changes to the existing expressway ramps and traffic patterns. As a result, traffic would be substantially improved in both present and future conditions. The specific transportation improvements for Alternative 3 are:

1. Removing two merge and weave movements between Storrow Drive (Route 3) and the Mystic Bridge. Traffic would be able to make these moves without having to cross through traffic on I-93.
2. Lengthening significantly (from 650' to 1800') the distance for those merges and weaves that must be made in the vicinity of the river crossing.
3. Improving access to the Mystic Bridge so it can operate at its full capacity, which is now constrained by the bottleneck of the river crossing. Increasing Mystic Bridge capacity adds to the overall Harbor crossing capacity.
4. Relieving the northbound Charles River crossing reduces the bottleneck on the ramp shared by traffic between Leverett Circle and the Sumner-Callahan Tunnels, as well as Leverett Circle to the Mystic Bridge and I-93 north.
5. Removal of the aerial ramps in City Square and improvement of access between I-93 and the Mystic Bridge allows local street improvements at City Square, and connection with major expressways and arterials.
6. Improving safety characteristics through removal of the S-curve from the expressway approaches to the

Mystic Bridge, decreasing traffic conflicts in the river crossing merge and weave, providing safety on local streets by removing through traffic, by improving interchanges between local streets and expressways, and through ground level improvements made possible by removing aerial structures.

Changes in the expressway network will provide opportunities for major improvements to local surface streets. These improvements vary by option:

Surface Street Scheme A gives priority to the movements between New Rutherford Avenue and the Charlestown High Bridge, with all other movements served by the rotary. No existing traffic movements are precluded.

Surface Street Scheme B gives priority to movements between New Rutherford Avenue, the Charlestown High Bridge, Chelsea Street, and the new ramps to the expressways. Some of the existing points for access from City Square into the residential community are reduced in importance. Residential access is consolidated at selected points in order to reduce the impact of through traffic on local streets. New connections are provided to Main and Park Streets for local residential access into City Square. Chelsea Street is separated into two one-way streets to allow for a turnaround for traffic from the Mystic Bridge into Chelsea Street and to allow for left-turn storage of vehicles going toward Park Street.

Surface Street Scheme C is very similar to Scheme B for major movements between arterial streets and the expressways. However, Chelsea Street is not separated into two one-way streets in this scheme. Traffic from the Mystic Bridge to Chelsea Street is directed through the tunnels under City Square and onto a loop linking to Rutherford Avenue for access into Chelsea Street and the Charlestown High Bridge.

For all surface street schemes, including others than those above that may be developed, the following surface street connections are made:

1. Chelsea Street is reconnected as it was before the Mystic Bridge was built;

2. Water Street is retained for access to the waterfront;
3. The proposed connection between Chelsea and Water Streets can be constructed, without limiting any of the surface street options that go along with these improvements;
4. Access for local people to the expressway network takes place at City Square and connects to the proposed connection between Rutherford Avenue and the Charlestown Bridge;
5. The Joiner Street ramps are removed, as are all the overhead ramp structures in City Square; this removes a substantial amount of through traffic from City Square and allows a more complete range of surface street options.

IV.C.3 Capacity

Alternative 3 would give substantial improvement to expressway operations. Operating speeds during peak hours would be increased from an average of 5+ mph to 30+ mph; accidents would be substantially reduced; delays and congestion will be reduced. Major improvements result from lengthening the weaving section on the Charles River Bridge.

The major capacity constraint at present for surface streets at City Square results from the disorganized street pattern and the supports for overhead structures which limit improvements. In combination with expressway improvements which will remove through traffic from local streets, alterations to the surface street patterns will improve the capacity in the City Square area.

IV.C.4. Construction Cost

The construction cost for Alternative 3, including construction of the new interchange in the rail yards west of Rutherford Avenue, removal of overhead ramps from City Square, provision of two new tunnels under City Square for expressway access to the Mystic Bridge, and implementation of a new local street pattern, is estimated to be \$75,000,000.

IV.D. SEPARABILITY FROM OTHER PROJECTS

Each of the alternatives for North Area transportation improvements can be undertaken without committing other projects. Where the alternatives include elements of both expressway and local surface street alterations, these projects can be built without precipitating further changes in highway or street patterns. One of the most frequently cited possibilities is the further work on the Central Artery which is currently undergoing examination. Another which has been mentioned often is the proposed connection between Chelsea and Water Streets. At one community meeting in Charlestown, the possibility of replacing the Mystic Bridge with an underground tunnel was also suggested. The following discussion has been included to show the relationship of each of the alternatives to these highway projects:

The No Build Alternative does not preclude any of the further work which may be scheduled for either highways or local surface streets. However, expenditure of funds on upgrading the present structure may make future attempts to reconstruct it on a new alignment (as in Alternative 3) more difficult; this would occur primarily as a result of efforts to amortize the investment for such improvements prior to undertaking another large investment in the same area.

Alternative 2 is identical to Alternative 1 in its impact on future construction projects; the one additional factor would be investment in City Square local street alterations, which would represent an additional fixed investment which may need to be amortized prior to any subsequent and presumably more major investment in the improvement of the streets of the area.

Alternative 3 has been designed to fit with several possible options which could follow its implementation or be built concurrently with it. The first such option is additional reconstruction of the Central Artery. Alternative 3 can be built as projected, connecting to the existing I-93 via-duct. If so built, it can later be modified to accommodate any major work proposed for the Central Artery. That work can be accommodated, whether the Central Artery is

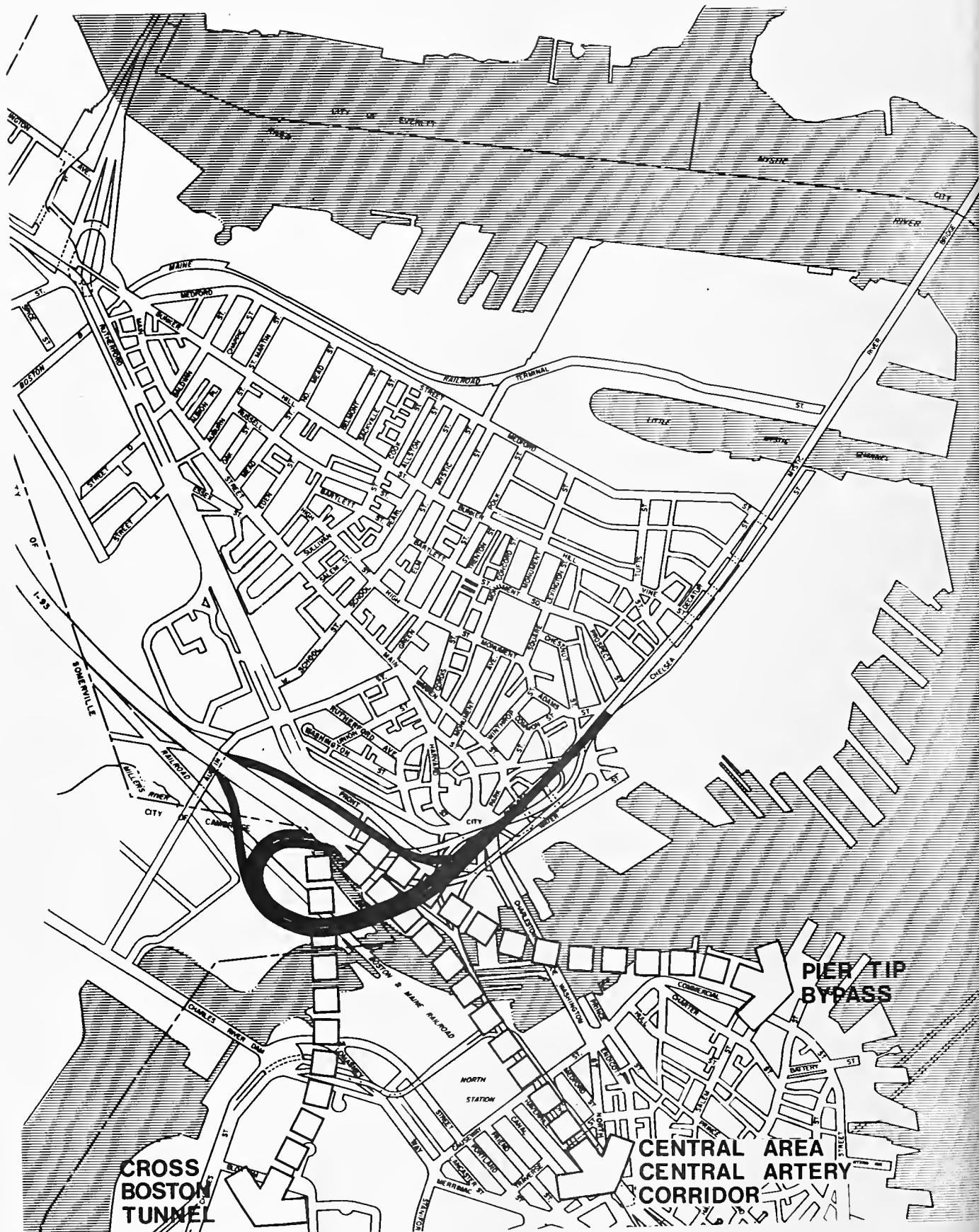
retained in its present configuration, rebuilt underground, or relocated on a new alignment. The design of Alternative 3 can accomodate any of these possibilities, by providing for structural supports and deck construction which adapts with very little loss of the investment proposed.

The Chelsea-Water Streets connection can proceed into implementation, prior to any of the elements of Alternative 3. A connection between these streets is essential for local circulation improvements. If Alternative 3 is implemented, a proposed element is an improved Chelsea Street, which would link directly into the Chelsea-Water Streets connection near the Navy Yard.

Although the suggestion for a tunnel to replace the Mystic Bridge may appear to be inappropriate at this time, if funding should ever permit so large an undertaking, Alternative 3 can be adapted to fit with it.

There are no transit projects which are directly affected or hindered by Alternatives 1,2 or 3. New bus service can be effected on any of the alternatives, and any of the commuter rail or rapid transit services which are already available or which may be improved will not be affected. New transit service to serve Charlestown or Cambridge can be implemented in any of the alternatives, including a proposed transit link to the Navy Yard and new National Park.

There is no transit alternative which can address the North Area transportation problems in Chapter II. However, the proposed highway improvements are compatible with existing transit service and facilities, and provide opportunities for future transit improvements. Alternatives 1 and 2 do not change the existing situation. Alternative 3 provides better service for existing express buses that pass through the area, and for local buses that would use improved streets in City Square and environs. None of the proposed Alternative 3 improvements impact commuter rail facilities or services. New structures that are west of I-93, and are part of Alternative 3, have been designed to avoid impacting commuter rail operations in the area. All alternatives preserve the existing rail right-of-way into the Navy Yard, and do not preclude future use of the rail right-of-way.



**RELATIONSHIP TO FUTURE
TRANSPORTATION IMPROVEMENTS**

FIG. IV-10

ANTICIPATED IMPACTS OF ALTERNATIVES



CHAPTER V. ANTIPLICATED IMPACTS OF ALTERNATIVES

Each discussion of an impact category begins with a statement of which specific impacts will be evaluated and consists of a description of the methodology and criteria used to evaluate impacts. This is followed by a description of their application to existing conditions and to the No Build and Build alternatives. The detailed aspects of methodology and analysis are included where needed to explain the approaches used.

V.A. Transportation Impacts

Transportation impacts have been evaluated in terms of traffic service, truck traffic and traffic safety.

V.A.1. Methodology - Demand Projections

The basic approach to evaluating transportation service impacts has been estimation of traffic demand for the year of opening (1980) and the design year (2000) and comparison with peak hour capacities of expressway and local surface street networks to establish levels of service for each of the three basic alternatives under consideration. This process consists of the following steps:

1. Establishing current traffic volumes on the highway and street network.
2. Estimating future traffic to be generated by proposed land use changes affecting the network.
3. Distributing future traffic demand on the highway and street network.
4. Comparing total traffic demand to capacity of existing highway and street networks (No Build Alternative) and each of the other alternative highway networks in order to estimate probable levels of service, safety and other characteristics. The evaluation was prepared for the "worst case" situation which is the p.m. peak hour.

V.A.2. Traffic Generators

Existing traffic demand in the project area consists of some local and through traffic generated primarily by current land uses. In the future, planned growth of the National Park and the Moran Terminal as well as re-development of the northern portion of the Navy Yard will generate substantially increased traffic demand. Since full re-use of the

Navy Yard would account for 75% of the projected increase in traffic volumes on local streets, its traffic demand has been included to provide a conservative worst case estimate of impacts.

Usage estimates were prepared for the National Park and the Moran Terminal Expansion (ultimate planned development). Usage estimates for the redevelopment of the Navy Yard were prepared in Land Use and Transportation Study, Boston Naval Shipyard, BRA & EDIC, 1975. The following volumes are predicted:

**Figure V-I Major Traffic Generators
P.M. Peak Hour**

	<u>1975</u>	<u>1985</u>	<u>1995</u>
Moran Terminal	50	70	70
National Park			
visitors	0	200	200
Navy Yard			
redevelopment	<u>0</u>	<u>0</u>	<u>1850</u>
Total	50	270	2120

Directions of approach were estimated from prior analyses of population, employment and other factors. The final step in the projections was the assignment of traffic to the network and the modification of the volumes due to diverted movements in the Build Alternatives 2 and 3.

V.A.3. Traffic Service Criteria

A capacity analysis was performed for critical locations on the Central Artery, I-93 and the connecting ramps to the Mystic Bridge and the local streets in Charlestown. This analysis was completed for each Alternative using ITE level of service definitions from A (unrestricted flow) to F (Stop and go). This analysis was supplemented by a qualitative evaluation of such characteristics as availability and location of turning movements.

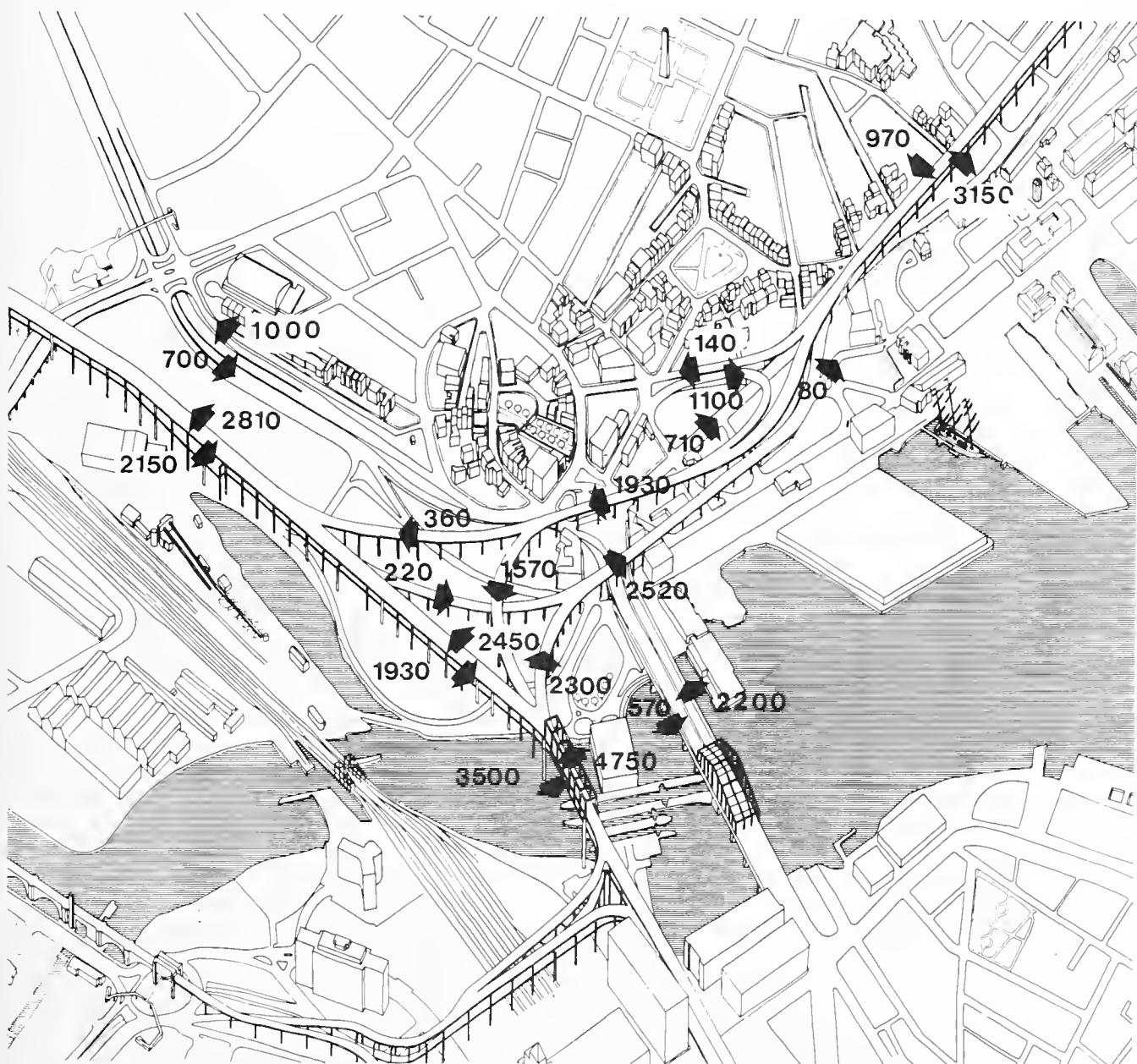
V.A.4. Traffic Service Impacts

Existing transportation service characteristics have been discussed previously in Chapter 2. Figure V-2 depicts existing traffic on the highway and local street network in the corridor as determined from the Massachusetts Department of Public Works and the City's Traffic and Parking Department counts.

V.A.5. Impacts

The No Build Alternative

Traffic projections for the No Build Alternative are summarized in Figure V-3 below. The year 2000 projections assume major redevelopment in Charlestown and the Water-Chelsea Street Connector. These projections assume implementation of National Park plans and full redevelopment of Navy Yard properties.



1975 P.M. PEAK HOUR TRAFFIC - EXISTING

FIG. V-2

Figure V-3 No Build Two Way Traffic
Demand Projections
(P.M. Peak Hour)

	1980	2000
I-93	4960	5340
Mystic Bridge	5500	5750
Central Artery River Crossing	8250	9500
Charlestown Bridge	2770	2970
Rutherford Avenue	1560	2270

Directions of approach for the generated traffic were estimated from prior analyses of population, employment and other factors.

Delay times for traffic on both I-93 and Route 1 have been analyzed for in-bound traffic during a.m. peaks using only weekdays. Average queues on I-93 southbound during a.m. peak hours extend from the Central Artery Bridge (the I-93 Route 1 gore) to a point north of Sullivan Square in Charlestown, a distance of 1.5 miles. Average running speeds on this section of I-93 are 7.5 miles per hour, with an average running time of 12 minutes. On the Mystic Bridge (Route 1) average queues from the Central Artery Bridge for the a.m. peak hours are 0.75 miles, with average running speeds of 5 miles per hour. The average delay per vehicle on I-93 and the Mystic Bridge yields 549,000 vehicle hours of delay for the a.m/p.m. peak periods per year.

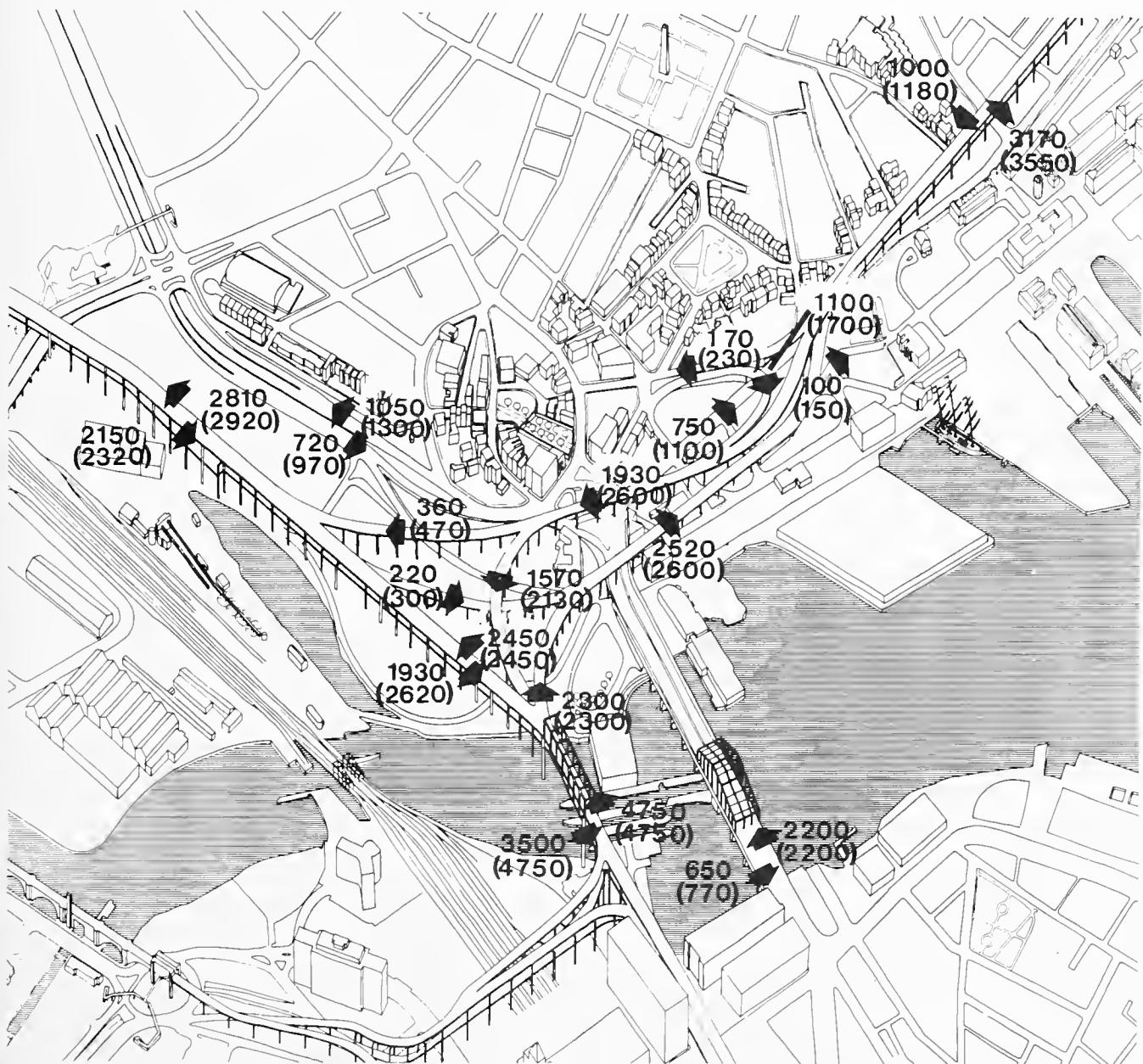
It can be expected that these queues and therefore the overall travel time delay will increase significantly in future years because of projected increases in population and employment in this part of the region.

Other Modes

Contributions of other modes of transportation are relatively small. Existing public transit service to the project area is limited to two bus lines linking Sullivan and Haymarket Squares. Direct transit is not a viable alternative to the proposed improvements because it would be neither economical nor capable of serving truck traffic on Interstate 93, the Mystic Bridge or the Central Artery. At the same time it should be recognized that upgraded bus service to the project area would be a valuable asset from a developmental standpoint and would reduce the number of autos, noise and air pollution and pedestrian-vehicular conflicts. As redevelopment progresses, better bus service to this expanded market will become more feasible from an economic standpoint.

Projections are based on a moderate usage of bus service and bus connection to rail rapid transit at the Orange Line. Transit patronage was estimated to involve 10-30% of arrivals and departures depending on the particular land use, based upon existing transit usage levels for comparable facilities.

Any redevelopment of the Navy Yard would lead to overflow demand, further traffic intrusions into residential areas, and to longer rush hours than now exist. While lack of capacity would almost certainly prove a deterrent to



1980 & 2000 P.M. PEAK HOUR TRAFFIC: ALTS. 1 & 2

FIG. V-4

extensive redevelopment, the Navy Yards's advantageous location near the city core and waterfront suggests development pressure. The No Build Alternative would therefore foster difficulties for residential or commercial/industrial development purposes.

Alternative 2

Traffic projections for Alternative 2 do not differ from those of the No Build Alternative since there is little or no difference in capacity of the highway and local street network. Thus, there would be no change in overall travel time delay.

Alternative 3

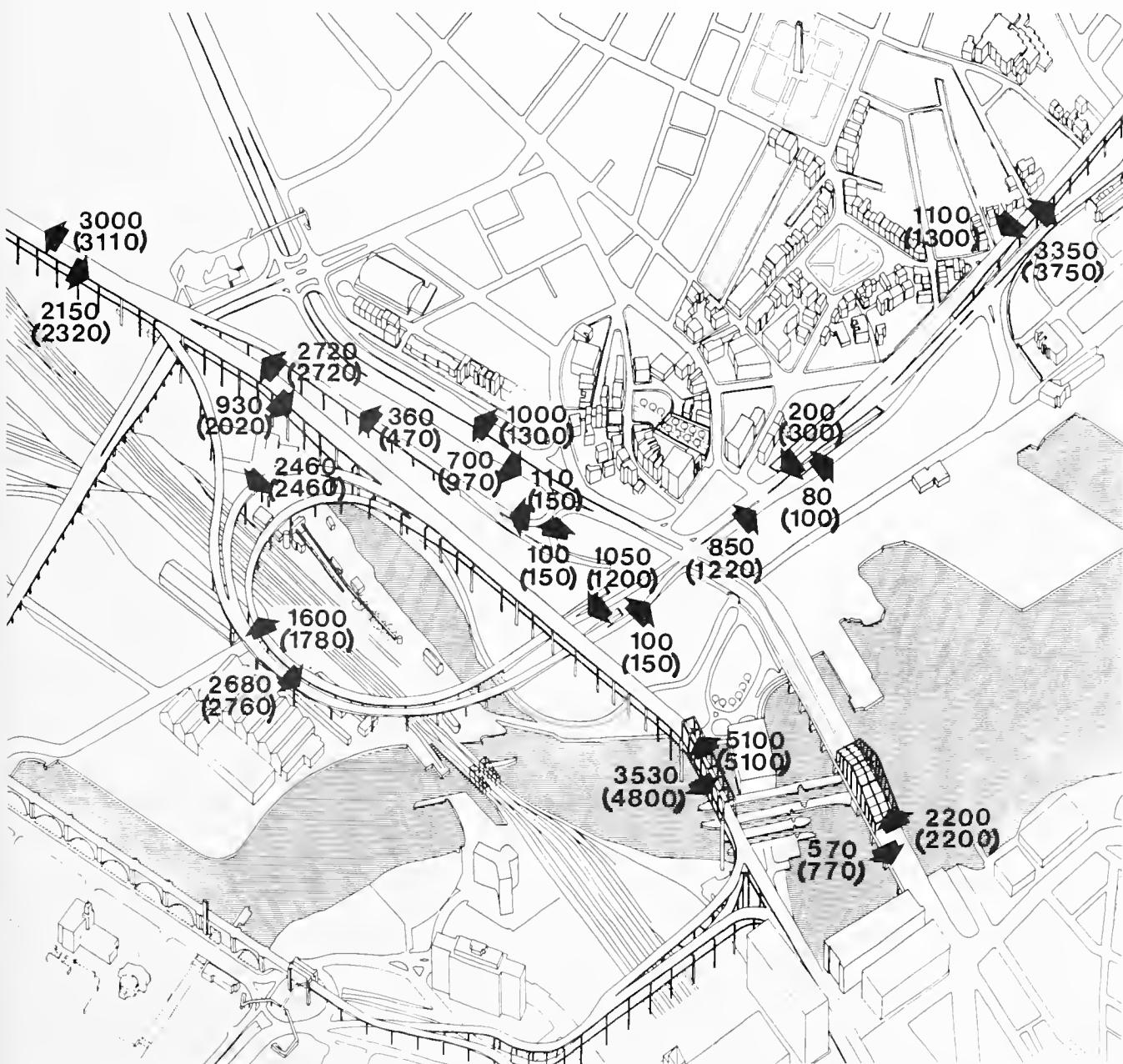
Traffic demand projections for Alternative 3 are summarized below in Fig. V-5. These projections assume full implementation of National Park plans and full redevelopment of the Navy Yard facilities; in both cases, traffic is distributed on the new highway and local street system, including the Water-Chelsea Street Connector.

Figure V-5 Alternative 3 Traffic Demand Projections (P.M. Peak Hour)

	1980	2000
I-93	7200	8150
Mystic Bridge	6000	6300
Central Artery River Crossing	8600	10200
Charlestown Bridge	2770	2970
Rutherford Avenue	1560	2770

Comparison of the No Build (and Alternative 2) and Alternative 3 shows that the most dramatic difference is the increase of traffic on I-93 and the Mystic Bridge which results from the slight increase in capacity of the Central Artery River Crossing. Alternative 3 can adequately carry the projected year 2000 volumes; during the p.m. peak hour in the year 2000, the critical weave section to and from I-93, the Mystic Bridge, the Central Artery and Storrow Drive will operate at level of service D or E with operating speeds of 30 mph. Traffic in the City Square area would operate at level of service D during the p.m. peak hour because of improved intersection configuration and signalling.

Travel time delay would be reduced by 415,220 vehicle hours during the a.m. and p.m. peak period on an annual basis. Using an average auto occupancy rate of 1.4 and a value of travel time of \$4.30 per hour per passenger, the total annual dollar value of travel time through reduction in delay is estimated to be \$2,785,800. Saving in vehicle operation is estimated at \$683,000.



1980 & 2000 P.M. PEAK HOUR TRAFFIC: ALT. 3

FIG. V-6

V.A.6. Truck Traffic Impacts

The basic criterion is the number of heavy trucks on local streets. The fewer on residential streets, the better.

The No Build Alternative

The No Build Alternative leaves the present truck problems in Charlestown untreated. The use of the existing streets in the corridor by trucks would remain. The No Build Alternative implies increases in heavy truck traffic through City Square as trucks use the Charlestown Bridge to reach Downtown Boston. Counts by the BRA indicate that approximately 11% of the traffic in City Square was truck traffic (vehicles of more than 4 tires). On the Central Artery River Crossing, approximately 4.5 percent of the existing traffic consists of heavy trucks during the p.m. peak hours.

Alternative 2

Alternative 2 will have no impact on truck traffic other than making traffic flow more smoothly on local streets in City Square.

Alternative 3

Alternative 3 will have more impact on the distribution of local traffic in the vicinity of City Square. As the weave section of I-93 increases in length, some truck traffic might divert to the major highways from local streets. However, it is not possible to quantify the expected number of trucks on any given street without more comprehensive traffic data being available. In any case, it is reasonable to expect Alternative 3 to remove truck traffic from residential streets in Charlestown.

Trucks carrying dangerous cargo are at present using local streets and expressways for access to and from the Mystic Bridge. With the introduction of tunnels under City Square, as proposed in Alternative 3, there will be some restrictions on truck use of the tunnels. Trucks which cannot use the tunnels will be diverted to the exit ramps to Chelsea Street, across Rutherford Avenue, and onto the expressway ramps via the surface routes.

V.A.7. Traffic Safety Impacts

Perhaps the most significant qualitative findings of prior accident studies is the clear relationships between the number of accidents and the amount of congestion on expressways; as traffic volume increases, so does the number of accidents.

While the present state-of-the-art does not allow for the definitive development of projections of the number of accidents for such a complex location as the North Area, there has been sufficient research undertaken to provide an estimate of future actions given specific changes to the roadway. Prior studies suggest that fewer, simpler and more separated decision points result in a lower probability of driver conflict, and thus an accident, being reduced.

A major benefit of a transportation improvement in the North Area is the dollar savings associated with the reduction in accidents. In the North Area, there were 244 accidents on I-93 (Central Artery) identified as occurring within the limits of the proposed projects. These accidents occurred within the calendar year 1975, the most recent available data, and represent only "reportable" accidents. These are accidents involving either property damage in excess of \$200, a non-fatal injury-producing accident, or a fatality. Such accidents must by law be reported by the motorist to the Registry of Motor Vehicles.

Figure V-7 presents a breakdown of the accident data for the North Area on I-93.

Figure V-7
I-93 North Area 1975 Accident Data

Total Accidents	244
Property Damage Only	198
Injury Accidents	46
Injuries	66
Multiple Vehicle Accidents	222
Total Vehicles Involved	498

The 244 accidents represent 29% of the 847 accidents that occurred on I-93 from the North Area to Massachusetts Avenue in Boston. However, the 244 accidents occurred within a distance of 1800+ feet or 10% of the section of I-93 defined above.

There is nothing to indicate that the accident experience of the area will be modified unless corrective measures are taken. Neither Alternative 1 or Alternative 2 will have any modifying effect on the accident rate. Alternative 3 presents a method whereby the distance over which conflicts are occurring is increased substantially, thus eliminating the dangerous short weave section where many accidents now occur.

The No Build Alternative

It is reasonable to expect that accidents in the North Area will increase if traffic volumes and congestion increase. In the No Build Alternative, no changes to the present street and expressway network will result from proposed expenditures.

Motorists will have decision points throughout the weave section of the expressways, which are considered to be hazardous. In addition, on and off ramps were not designed to interstate highway standards. The present layout of local streets in City Square also has a number of conflict points, which increase the probability of accidents.

Alternative 2

This alternative assumes improvements to the surface streets in City Square in addition to the replacement of the viaduct decks proposed in Alternative 1. While more orderly flow of traffic in City Square will improve safety on local streets, there would be no significant effect on the expressway accidents. No change would be made to the Charles River Bridge weave section, entering or exiting ramps, or the Mystic Bridge approaches. Therefore it is reasonable to assume that under present traffic conditions improvements to City Square will have an insignificant effect on the overall safety of the North Area.

Alternative 3

Alternative 3 extends the weaving distance over which conflicts are occurring on the expressways, and thus the probability of accidents occurring will decrease as a result of a smoother flow of traffic through this weaving section. Alternative 3 offers the highest level of safety among all alternatives because the length of time required to make a decision on the weave

section increases substantially. By extending the distance over which conflicts are occurring, the probability of accidents will decrease. Final engineering will insure that keeping the distance between decision points as long and as visually unobstructed as possible be given top priority. The improved visibility on wider curvatures on ramps will reduce the risk of accidents.

Four recognized techniques have been used to estimate future accidents in the I-93/Route 1 weave section in the North Area. To maintain a conservative approach, the estimated number of accidents used in the analysis of benefits is 67, representing a 72.5% reduction in accidents. It has also been assumed that with proper channelization and improved signalization, a 30% reduction in accidents might be expected. It also has been estimated that a realignment of the S-curve approach to the Mystic Bridge will result in a 50% reduction in accidents.

Using dollar values recommended by the National Safety Council (1974) and U.S. Department of Transportation (1975) of \$550 per Property Damage Only (PDO) accidents and \$9000 per non-fatal injury accident, the estimated dollar value of accident reduction is \$564,000 annually.

V.B CONSTRUCTION IMPACTS

In the evaluation of potential impacts, those associated with construction have been identified as most significant. These impacts must be considered in determining construction phasing. For all alternatives, construction impacts are among the most serious. These impacts vary by alternatives, and by construction phasing techniques which may be utilized. Staging plans have been developed for each alternative. These are summarized below, along with the impacts resulting from construction, and the way staging and construction techniques can be used to control impacts.

V.B.1 Construction Staging and Impacts

Alternative 1

During construction, one lane will be redecked at a time. This technique was used on the recent reconstruction of the Mystic Bridge decks. At present, there is only a one lane entry to the

Central Artery during the A.M. peak. The entering roadway acts as storage for three lanes of traffic. Removal of one lane during redecking procedures will extend the length of the queue.

Alternative 2

The measures described for Alternative 1 will also be used in work on Alternative 2 to replace the expressway decks. In addition, improvements to the local surface streets in City Square will include these measures during construction: 1. all local access presently available and to be retained in the completed surface scheme will be kept open during the construction period. 2. Temporary detouring of traffic from local streets may be necessary for minor periods while work is accomplished on streets entering City Square. Staging and timing of local street improvements will be planned to minimize traffic and community disruption.

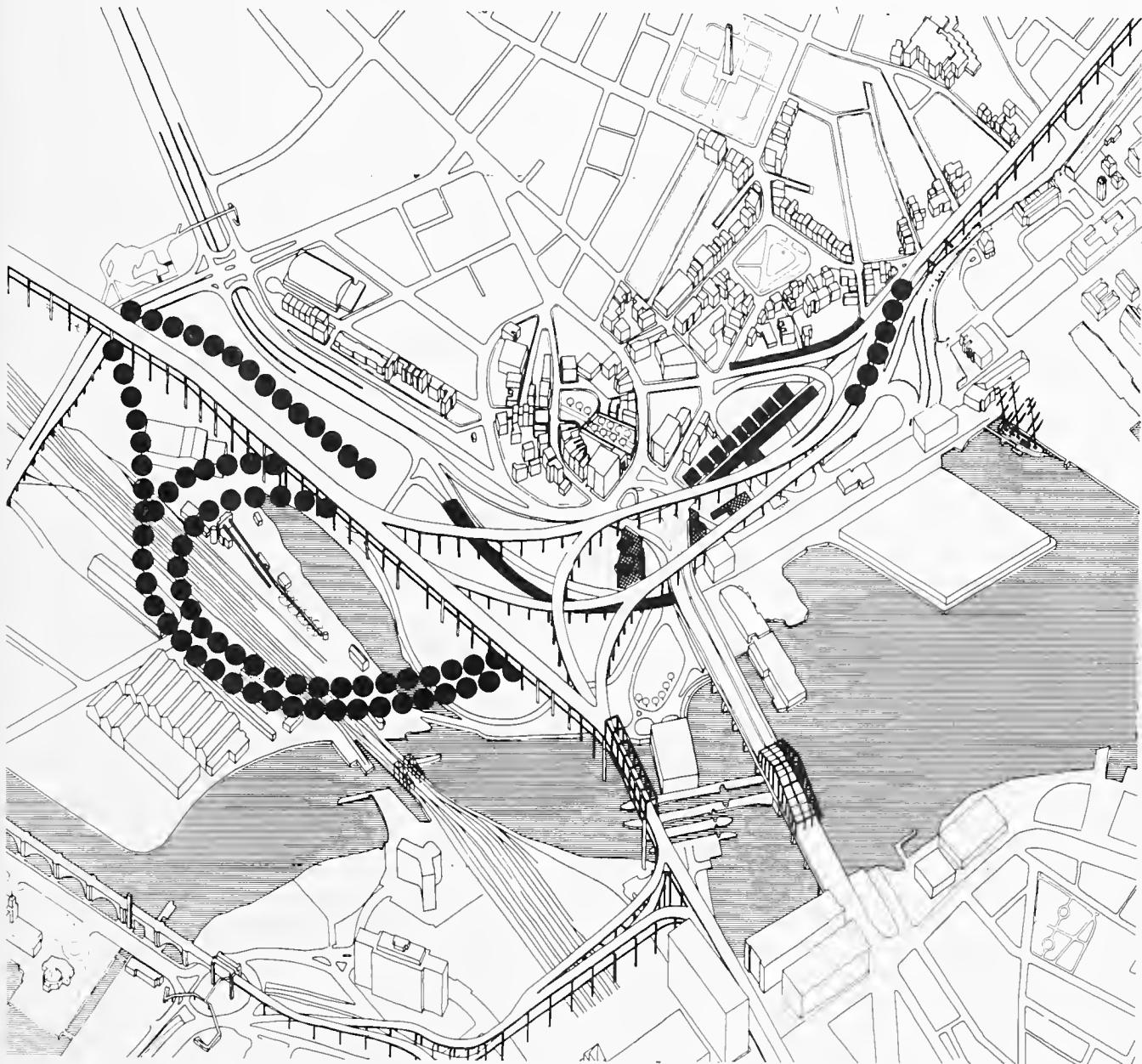
Alternative 3

Construction phasing is an especially important aspect of potential disruption during the construction period. To minimize potential disruption, a sequence of construction has been proposed as illustrated on the following pages.

In addition to the special considerations of construction sequencing, standard precautions will be taken to minimize noise, dust, erosion and disruption to traffic patterns. These measures include:

1. Identification of location for disposal of unsuitable material excavated during construction of the tunnels.
2. Calcium Chloride, Bitumen and water will be used to control dust at construction sites.
3. All equipment and procedures will conform to the state regulations regarding noise, air pollution and other aspects on construction operations.
4. Use of dikes to control erosion in any locations where appropriate.
5. Activity which might divert driver's attention will be screened from view, to avoid additional safety problems.
6. Police officers will be provided as necessary to direct and control traffic.

- Stage 1: a) construct trumpet interchange west of City Square and relocate Front St., Chelsea St., and Lowney Way
 b) construct temporary alignment for upper deck of Mystic Bridge
 c) construct section of south-bound tunnel along Chelsea St.



STAGE 1: CONSTRUCTION SEQUENCE - ALT. 3

FIG V-8

SURFACE STREETS:



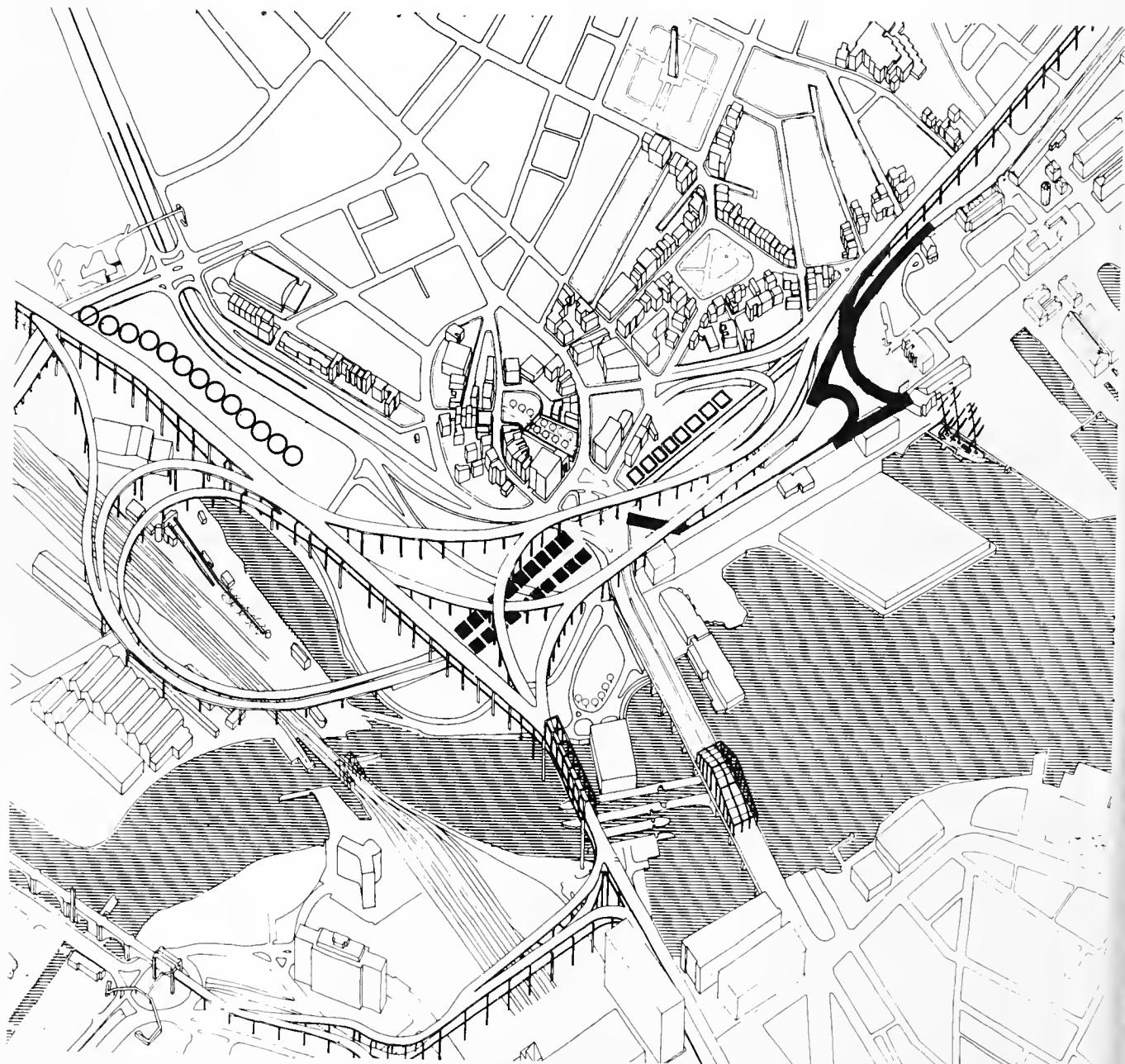
ELEVATED STRUCTURES:



TUNNELS:



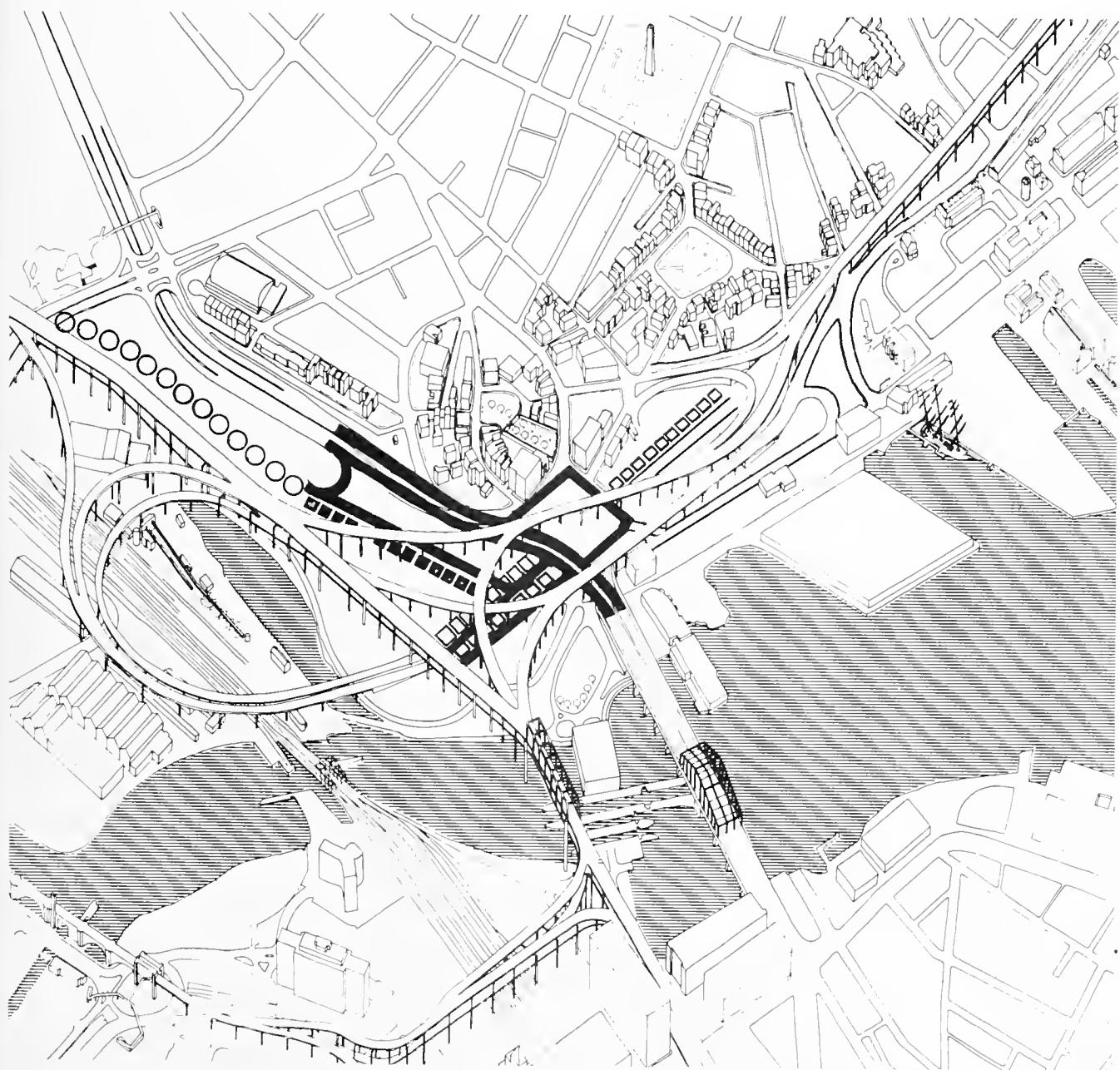
- Stage 2: a) construct tunnels on west side of City Square
b) construct temporary connection between Water-Chelsea Connector and lower deck of Mystic Bridge
c) construct temporary local roadways



STAGE 2: CONSTRUCTION SEQUENCE - ALT. 3

FIG. V-9

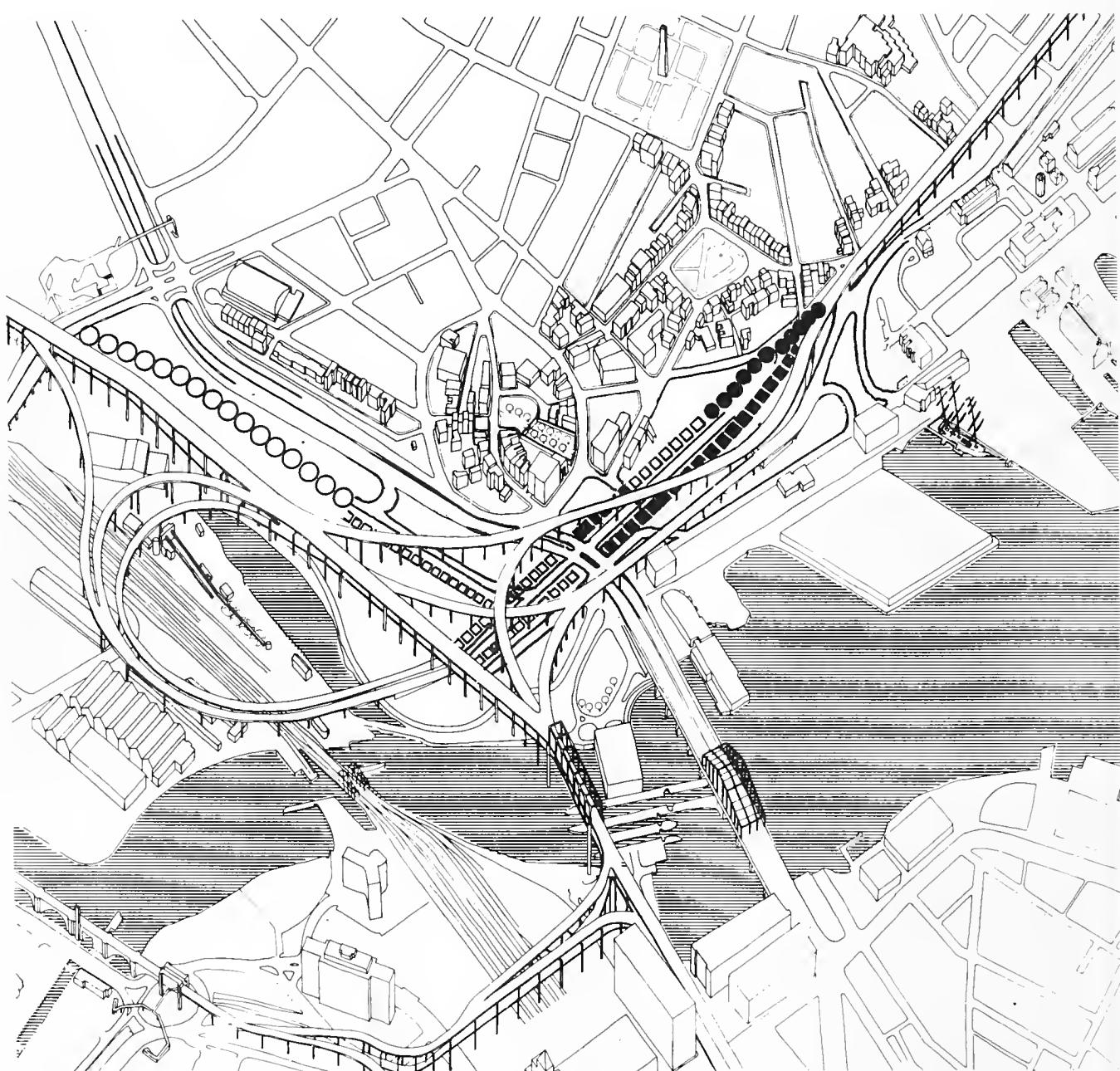
- Stage 3: a) construct Rutherford Ave. on new location
b) construct (partially) new ramp connections on west side of City Square to I-93



STAGE 3: CONSTRUCTION SEQUENCE - ALT. 3

FIG. V-10

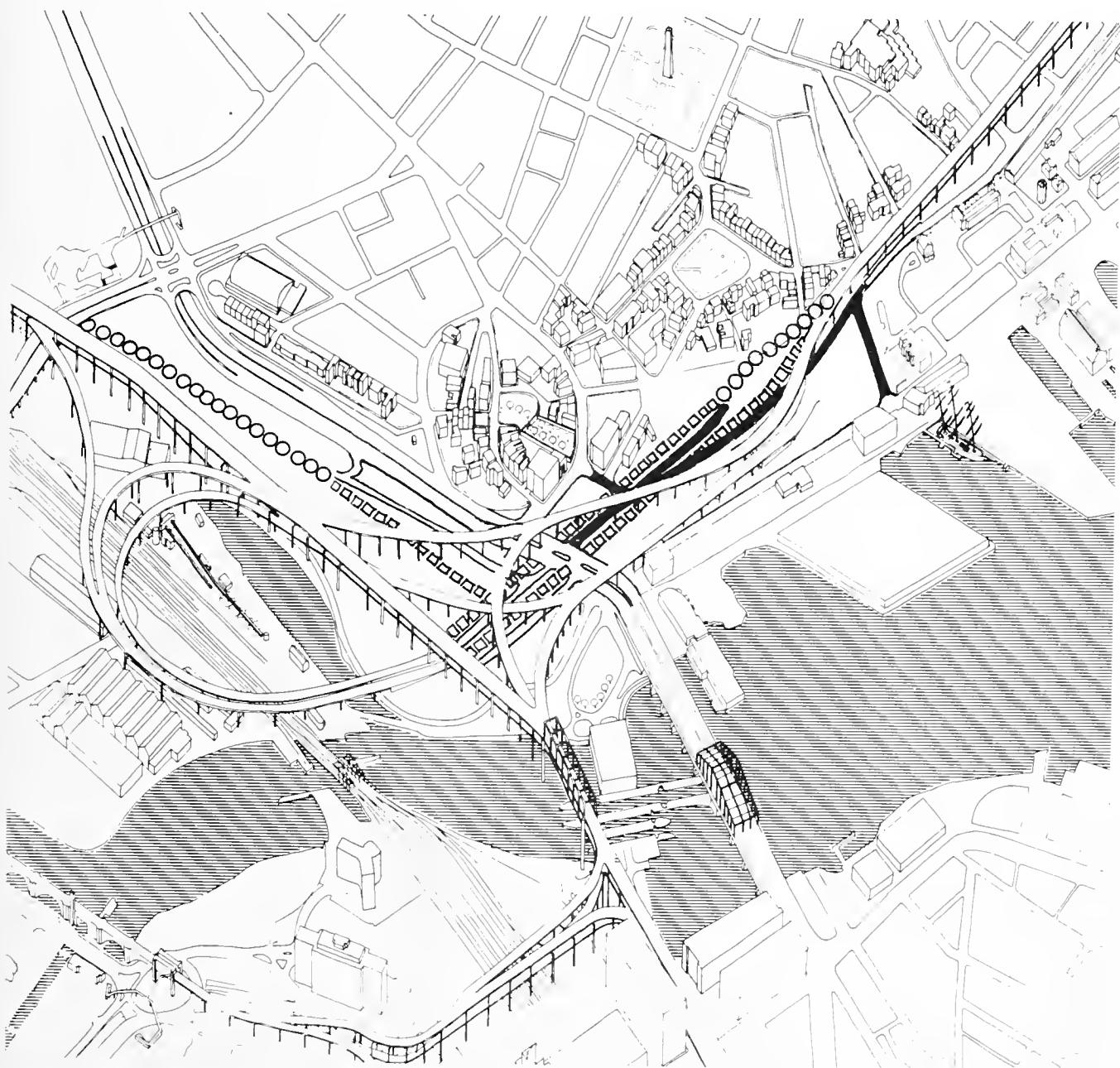
- Stage 4: a) complete tunnels northbound and southbound to Mystic Bridge, including connections to upper deck
b) complete ramp connections to I-93 west of City Square



STAGE 4: CONSTRUCTION SEQUENCE-ALT.3

FIG. V-11

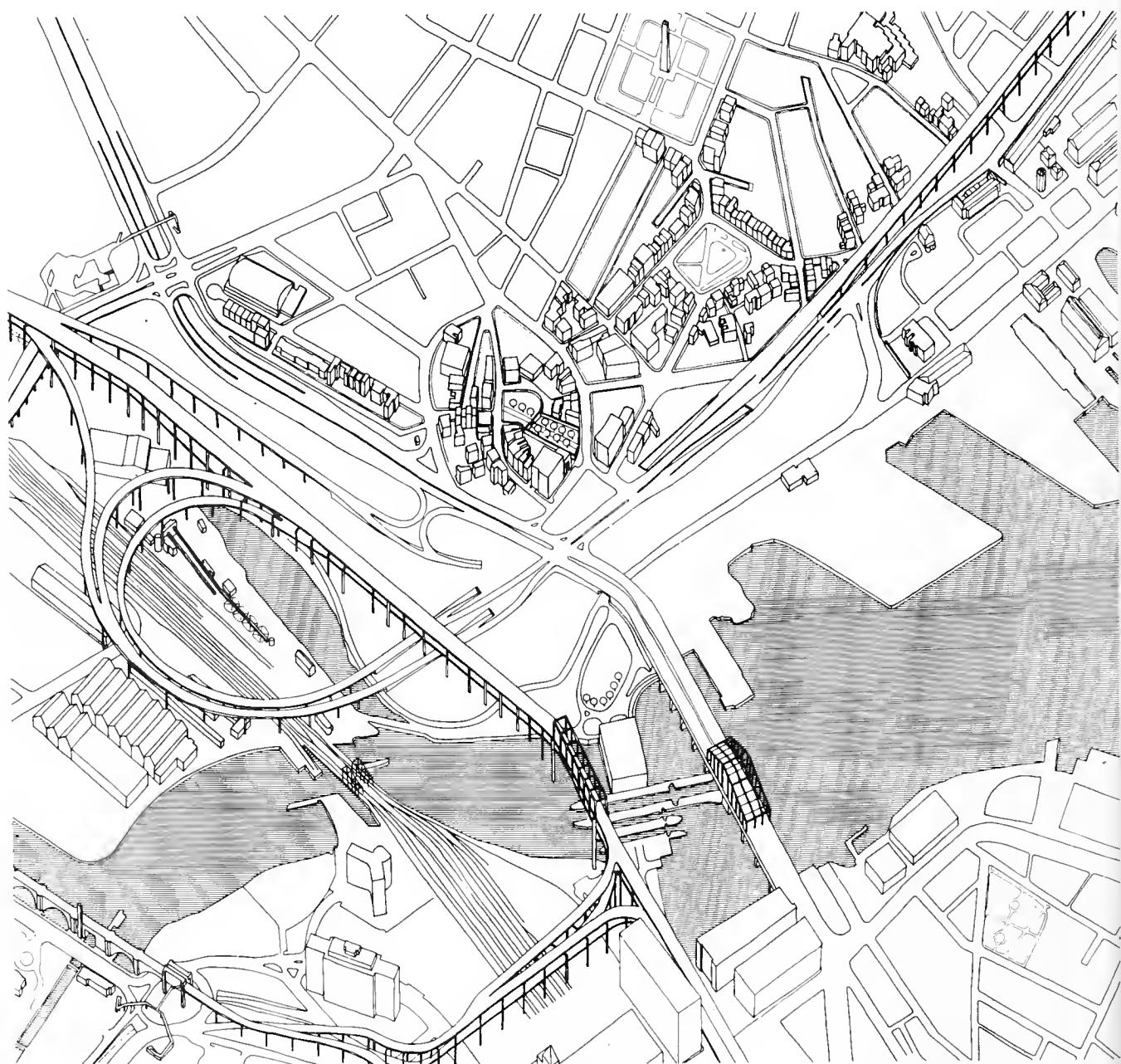
Stage 5: a) complete lower deck connection
to Mystic Bridge



STAGE 5: CONSTRUCTION SEQUENCE-ALT. 3

FIG. V- 12

- Stage 6: a) shift traffic to new alignment
b) remove viaducts, complete surface streets and landscaping



STAGE 6: CONSTRUCTION SEQUENCE - ALT. 3

FIG. V-13

V.C

AIR QUALITY IMPACT

An analysis of existing and future emissions of vehicular air pollutants was conducted in order to quantify the air quality impacts of the proposed alternatives within the study area. The principal contaminants emitted by motor vehicles are carbon monoxide (CO), hydrocarbons (HC), oxides of nitrogen (NO_x), sulfates and other oxidation products, and particulate matter.

Existing concentrations of air pollutants in this area are high. Substantial data-gathering has been done within the past two years in connection with the Chelsea-Water Streets Connector Study, to establish existing "worse case" CO levels in the area where the Central Artery connects with the Mystic-Tobin Bridge. The results of this data-gathering effort serve to characterize the existing conditions, or "base case," associated with the present project as well.

Figure V-14

Maximum Measured CO Concentrations (ppm)
(4 September-4 November 1975)

Averaging Period	Maximum Concentration	Air Quality Standard
1-hour	10.2	35
8-hour (continuous)	5.1	9

Figure V-14 indicates that at no time during the 60-day monitoring period were the 1-hour or 8-hour standards for CO exceeded. Statistical techniques were applied to this short-term measurement data to estimate the maximum likely annual concentrations of CO at the measurement site. The resulting estimated annual concentrations were only slightly higher (less than 3 ppm) than the 60-day measured values. The conclusion is that no violations of the air quality standards occurred during 1976 at the measurement

location. Figure V-15 presents the total annual emissions levels calculated for the existing (1975) case.

Figure V-15

Total Areawide Emissions--Base Case (1975)

Pollutant	Gross Emissions, tons/year
CO	2402
HC	319
NO _x	141

V.C.2

Predicted Areawide Emissions

The effects of projected traffic volumes in the study area upon localized and overall air quality were estimated for each of the three design alternatives in two time frames: 1980 and 2000. The air quality impacts of each alternative are summarized in Figure V-16.

Figure V-16

Comparison of Areawide Pollutant Emissions,
1980 and 2000,
tons/year

	Year	Alt. 1	Alt. 2	Alt. 3
<u>CO</u>	1980	1215	1204- 1253	1117- 1155
	2000	585	575- 600	523- 542
<u>HC</u>	1980	198	196- 204	195- 201
	2000	92	90- 94	88- 91
<u>NO_x</u>	1980	106	105- 109	130- 134
	2000	78	77- 80	93- 96

As Figure V-16 indicates, the differences between alternatives tend to be small compared to the differences over time for any single alternative. Each of the "Build" alternatives provides some degree of improvement over the "No-Build" alternative with respect to CO and hydrocarbons. Alternative 3 would cause an increase in emitted NO_x levels of 22-27 per cent over the "No-Build" case in 1980, although this level is still less than existing NO_x levels and would continue to decrease as more vehicles become equipped with control devices.

V.C.3 Predicted One-Hour CO Concentrations

Three receptor sites in the vicinity of the proposed alternatives were selected from among the receptors identified in the earlier Chelsea-Water Street Connector Study. These three receptors were:

1. the Kent School, located between Tremont and Bunker Hill Streets, approximately 250 feet north of the Mystic Bridge.
2. Gate No. 1 of the Navy Yard, located approximately 300 feet southeast of the existing viaducts.
3. City Square, the site identified in the Chelsea-Water Street study as probably "representative of current maximum CO levels" in the area.

These three locations are shown on Figure V-12.

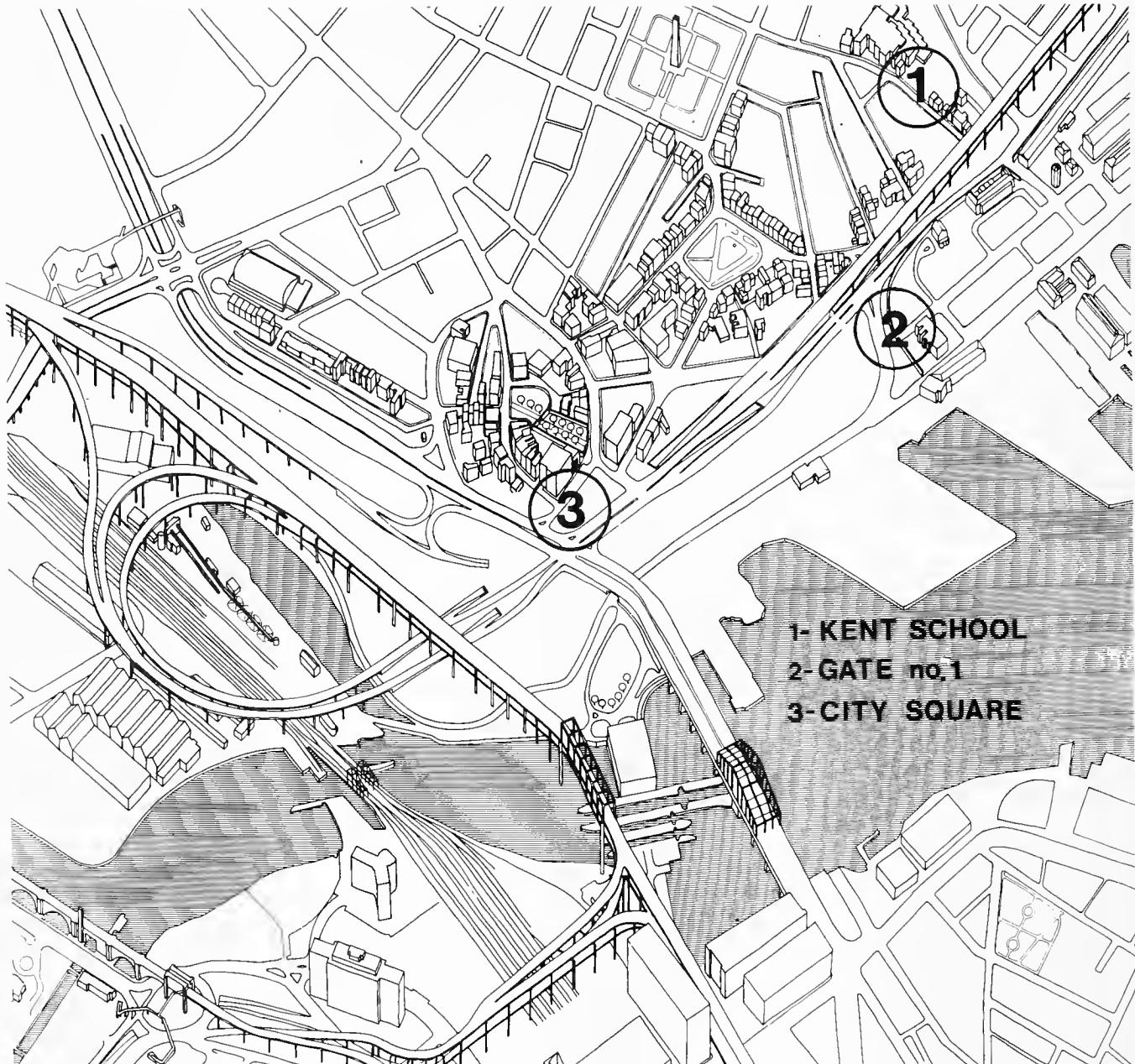
Estimates of CO concentrations at each of these locations were made for the existing case (Figure V-17), and for each of the project alternatives in 1980 and 2000 (Figure V-19).

Figure V-17

Existing 1-Hour CO Concentrations-- Comparison of 2 Analysis Cycles

Location	Predicted CO Levels, ppm	NAAQ Standard, ppm
	Chelsea-Water Study	Present Analysis
Kent School	22.5	20.7
Gate #1	18.9	10.0
City Square	51.8*	50.1

*exceeds standard (35 ppm)



AIR QUALITY RECEPTOR SITES

FIG. V-18

A brief review of Figure V-19 yields the following conclusions:

1. At no location is the air quality standard exceeded under any alternative. In City Square, where the standard is exceeded in the present case (see Figure V-17), concentrations are expected to be reduced below the air quality standard regardless of which alternative is selected

2. At the Kent School site, little difference in CO concentrations is observed regardless of which alternative is selected. The school is beyond the range of the immediate construction area, so its location with respect to the Mystic Bridge is unchanged. No significant differences in traffic volumes on the bridge among the alternatives implies no significant difference in CO concentrations.

3. Projections obtained for Gate #1 may be taken only as indicators of relative magnitude of change among alternatives. However, no differences in CO concentrations resulting from the project alternatives under discussion could be discerned in this analysis cycle.

4. City Square benefits under either of the "Build" alternatives, because of improvements to surface streets (Alternative 2 and 3) and/or depression of the I-93/Mystic Bridge ramps under City Square in tunnel. It should be added, however, that the pollutants removed from City Square by depressing these ramps will tend to collect at both ends of the tunnel.

Figure V-19

Predicted 1-Hour CO Concentration
Project Alternatives
(ppm)

	Kent School	Gate #1	City Square
Alternative 1			
1980	10.6	5.3	31.2
2000	7.8	3.7	20.0
Alternative 2			
1980	10.6	5.3	28.2
2000	7.8	3.7	14.7
Alternative 3			
1980	10.6	5.3	20.2
2000	6.9	3.7	10.0

V.C.4 Predicted 8-Hour CO Concentrations

Based upon the existing CO concentrations (see Figure V-14), predicted 8-hour CO concentrations have been developed for each of the alternatives at each of the receptor sites and for 1980 and 2000. They are shown in Figure V-18.

Figure V- 20

**Predicted 8-Hour CO Concentrations
for Project Alternatives (ppm)**

	<u>Kent School</u>	<u>Gate #1</u>	<u>City Square</u>
Alternative 1			
1980	3.0	1.2	13.7
2000	1.2	0.5	7.5
Alternative 2			
1980	3.0	1.2	9.1
2000	1.2	0.5	4.0
Alternative 3			
1980	2.5	1.0	7.6
2000	1.0	0.4	2.7

A brief analysis of Figure V-20 yields the following conclusions:

1. The only location where the 8-hour air quality standard for CO of 9ppm is exceeded is at City Square. However, concentrations are expected to be reduced substantially in the near future as a result of federal auto emission standards regardless of which alternative is selected.
2. At the Kent School site, there is only a minor difference in CO concentrations between Alternatives 1 and 2 and Alternative 3. The school is beyond the range of the immediate construction area, and therefore its location with respect to the Mystic Bridge is unchanged.
3. The 8-hour projections of CO concentration at Gate 1 may be taken only as an indicator of the relative magnitude of change between Alternatives 1 and 2 and Alternative 3. Only a minor change has been indicated from the analysis.
4. City Square gains the most benefits under either of the Build alternatives, because of the improvements to city surface streets which will improve traffic flow. The depres-

sion of the I-93/Mystic Bridge ramps in Alternative 3 will remove CO concentrations at City Square. However, it should be noted that CO concentrations will collect at either entrance to the tunnel beneath City Square.

V.D. NOISE

V.D.1. Predicted Noise Impacts

Estimates of changes in noise impact were made for the three alternatives. Two future time frame were considered -- 1980 and 2000.

1. 1980 No-Build: Since the system is presently operating near capacity, no change in traffic volume was assumed. Therefore, the degree of noise impact associated with this alternative is equivalent to the existing situation.

Expected noise impact....same as existing

2. 2000 No-Build: On the Mystic Bridge approaches noise level increases approximately one decibel. Other expressways experience smaller increases in volume. As demand continues to increase, the percent of the day during which the system operates at capacity (stop-and-go conditions) increases. Therefore, noise impact also increases slightly in all areas where the expressways are dominant noise sources.

Expected noise impact....slight increase in impact over existing conditions

3. 1980 Alternative 2: Most important changes will involve completion of New Rutherford Avenue with Charlestown High Bridge, providing free flow around City Square. Result would be a reduction in stop-and-go movements on Rutherford Avenue leading into City Square (noise level reduction around 2-4 dBA (L10)), balanced by slightly increased volume due to expanded capacity (volume increase on the order of 8 percent, negligible in terms of noise level increase).

Expected noise impact...slight benefit to abutters of lower Rutherford Ave. and City Square area

4. 2000 Alternative 2: Situation virtually the same as No-Build; no significant change in noise impact at any noise-sensitive location.

Expected noise impact...Same as 2000 No-Build

5. 1980 Alternative 3: This plan will create some perceptible changes to the noise climate in the area.

- A. Approaches to the Mystic River Bridge:
Reduction of noise levels in City Square area; some benefits to residences behind City Square, for which line-of-sight view of aerial approaches is eliminated.
- B. Increased grade on approaches to Mystic Bridge from City Square tunnel:
Little effect on automobile noise; accelerating trucks on grade may create slight increases in noise levels at residences close to the bridge approaches.
- C. Completion of New Rutherford Avenue with Charlestown High Bridge: Expected noise impact: reduction in noise associated with stop-and-go operations in City Square, especially accelerating and decelerating trucks; balanced by slightly higher noise levels due to increased volumes using the improved road (same as for Alternative 2 discussed above).
- D. New ramp configuration providing access to I-93: The "trumpet" ramp segments will have negligible noise impact, because they are not within range of any noise-sensitive land uses in either Cambridge or Charlestown. the single ramp which provides access to I-93 northbound from the tunnel under City Square is located about 330 feet from residences along Lynde Street in Charlestown. Expected noise impact: slight increase in noise levels due to trucks on access ramp; less significant south of Union Street, where New Rutherford Avenue will remain the closest unshielded noise source.
- E. Some reduction in stop-and-go movements caused by lengthening of weaving

distances on the Artery (I-93) Charles-town High Bridge. Expected noise impact: minor reduction in peak truck noise levels; no change in average background noise levels (or, slight increase if eased merging situation causes increased traffic flow on bridge).

The several areas which may experience minor (i.e., 2dBA or less) changes in noise levels (either beneficial or adverse) as a result of Alternative 3 are:

- A. Residences along Lynde Street within line-of-sight view of the proposed I-93 north approach ramp; especially north of Union Street, where Rutherford Avenue becomes depressed under Austin Street.
- B. Residences and other noise-sensitive land uses along the lower section of Old Rutherford Avenue and Harvard Street, within sight of both New Rutherford Avenue and the existing aerial expressway approaches through City Square.
- C. Residences located near existing Joiner Street ramps to and from bridge approaches; existing ramps are removed under Alternative 3; new "down" ramp close to residences on both sides of Park Street will aggravate existing noise impact situation.
- D. Residences and other noise-sensitive land uses (school, playground) on Mount Vernon, Chestnut, Prospect and Tremont Streets near Lowney Way, which may be moderately affected by increased grades (5 percent) on the Mystic River Bridge approaches emerging from the tunnel under City Square.

6. 2000 Alternative 3: Similar to 1980 situation; traffic volumes will increase on the expressways and local streets, resulting in a slight increase in noise levels areawide.

Expected noise impact...Slight increase over 1980 Alternative 3

Noise Level Calculations: Calculations of noise levels using 1980 volumes were carried out for each of the four areas identified as potentially subject to change: Lynde Street area, Rutherford and Harvard Avenue approaches to City Square, Joiner Street ramps area, and streets which terminate in Lowney Way.

When possible, calculations were carried out at a location where measurements had been made; for these cases, the original measurements served to verify the calculations, or to indicate that some other source other than the roadway in question (e.g., traffic on local streets) was in fact the dominant noise source for that area.

The most important conclusions drawn from these preliminary calculations were:

- A. In most of the locations examined, Alternative 3 would result in slight or negligible changes in the existing noise climate which is already extremely noisy, and the proposed scheme does not result in traffic increases or decreases large enough to affect significantly these existing levels. This is true even in City Square; even though the tunnels under City Square will siphon off a large portion of through traffic, surface truck volumes in the square and on relocated Rutherford Avenue will still be quite high.
- B. Areas to be considered for noise abatement measures, include:
 1. Lynde Street area
 2. Lower Old Rutherford and Harvard Avenues
 3. Areas abutting steep grades on Mystic Bridge approaches, i.e., along Lowney Way.

While all these areas presently experience noise levels significantly in excess of the Design Noise Levels of FHPM 7-7-3 and will continue to do so regardless of which project alternative is chosen, only in the third area--along Lowney Way--does the proposed project itself create any potentially noticeable increase in noise levels.

V.E. LAND USE PLANNING IMPACTS

The alternatives have both direct and indirect impacts on land use planning in the project area. Direct impacts occur chiefly in the immediate construction area, while indirect impacts are related to potential reuses of contiguous areas. Impacts on other aspects of land use are discussed in other sections of this chapter.

V.E.1 Criteria

The basic criterion used to evaluate the land use planning impacts of an alternative is whether particular improvements tend to assist or constrain proposed land use plans and future opportunities for development.

V.E.2 Existing Conditions

Existing land uses and planning efforts in the future have already been described in detail in Chapter II.

V.E.3 Impacts

The No Build Alternative

This alternative has no direct impact. Projects or improvements which are already underway can continue with little change. The No Build Alternative will have effects of restricting development in and around the existing overhead expressway ramps. If the proposed Chelsea-Water Streets connection goes forward, there will be improved access into the Navy Yard. This alternative in no way affects that proposal.

Alternative 2

The proposals for improving local streets at City Square in this alternative will affect no structures. City Square open space will be redesigned in a new configuration, depending entirely on the surface street scheme chosen. The Chelsea-Water Street connection can go forward without change. However, development will continue to be restricted due to the overhead expressway ramps.

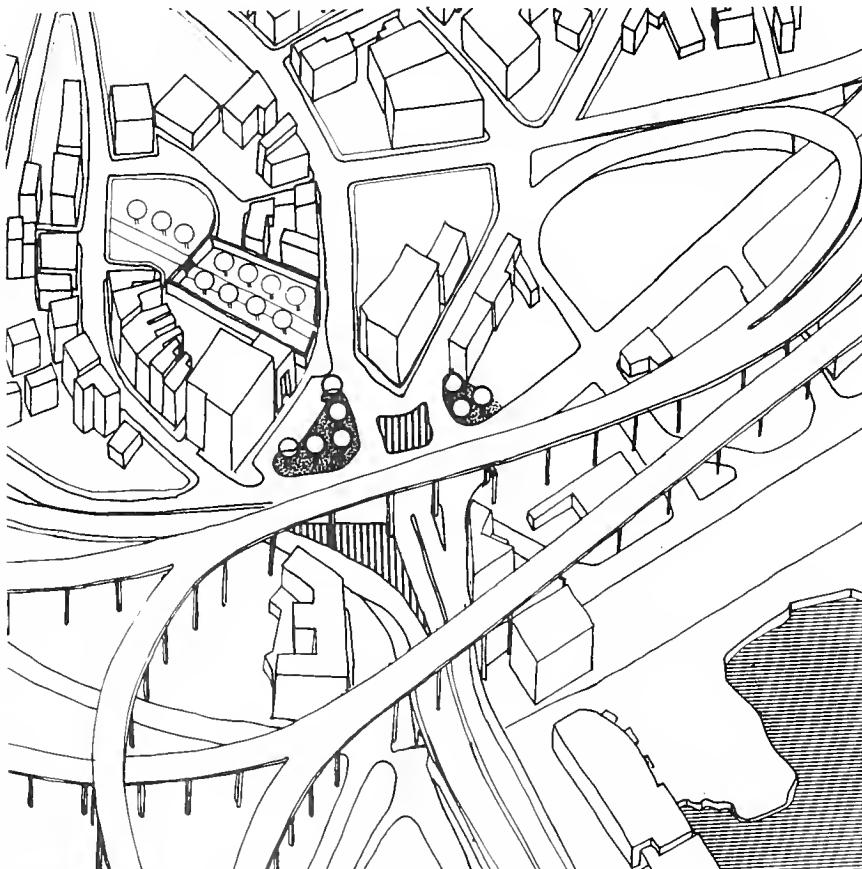
Alternative 3

Potential for development of new land uses in the area along Rutherford Avenue into and through City Square will be greatly enhanced by this alternative. It will open new

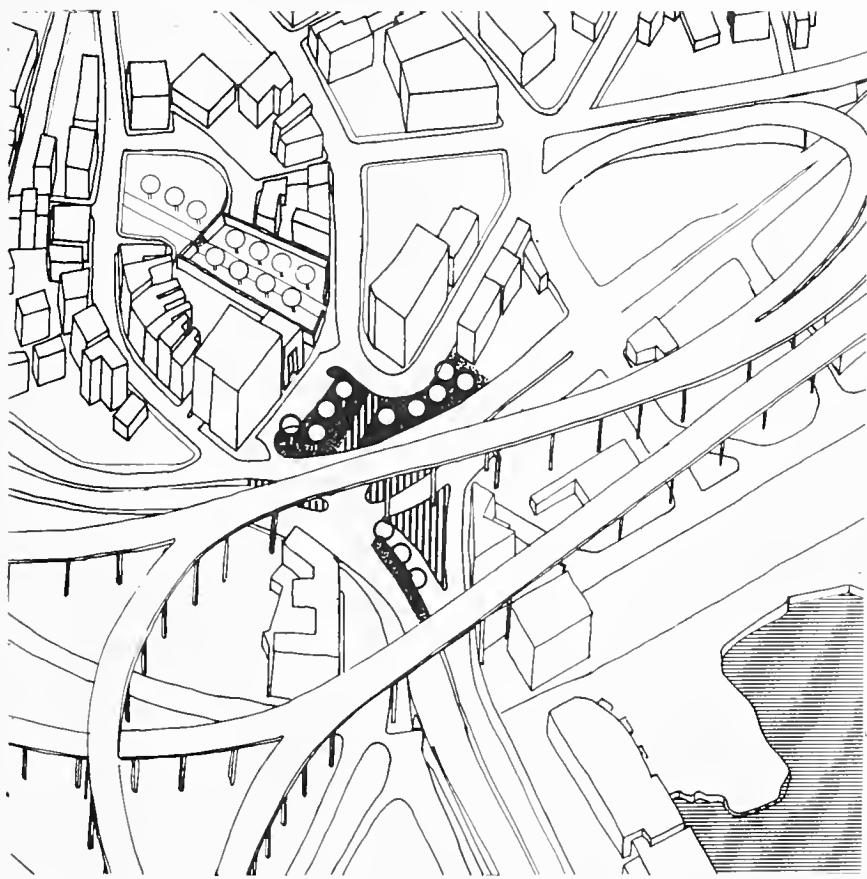
possibilities for land development in the Square, and along the waterfront between the new National Park and the Paul Revere Landing Park at the Charles River Dam. The few takings required in Charlestown are discussed in Chapter V.L and Chapters VI and VII. Potential impacts on industrial uses in the rail yard area are also discussed in those sections. At this time it is not expected that any of the properties in that area will be taken; but in any event, significant land use coordination efforts will be undertaken in conjunction with engineering designs to minimize impacts both during and after construction.

Land use and urban design possibilities for Alternatives 2 and 3 are illustrated on the following pages. Alternative 1 does not include options for altering land uses.

The first three figures (V-21, V-22, V-23) show street patterns and parcelization of land which is possible under each of the different surface street schemes associated with Alternative 2. Each of these is limited to modest changes around City Square.

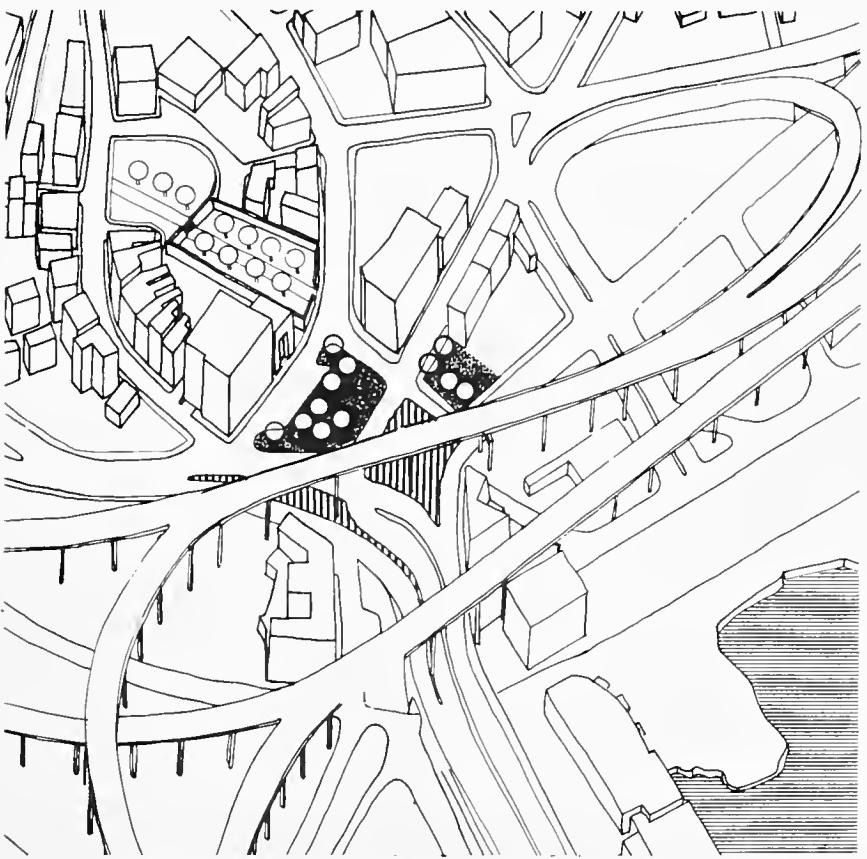


ALT. 2 "H": URBAN DESIGN POSSIBILITIES



ALT. 2 "T": URBAN DESIGN POSSIBILITIES

.FIG. V- 22



ALT. 2 "M": URBAN DESIGN POSSIBILITIES

.FIG. V- 23

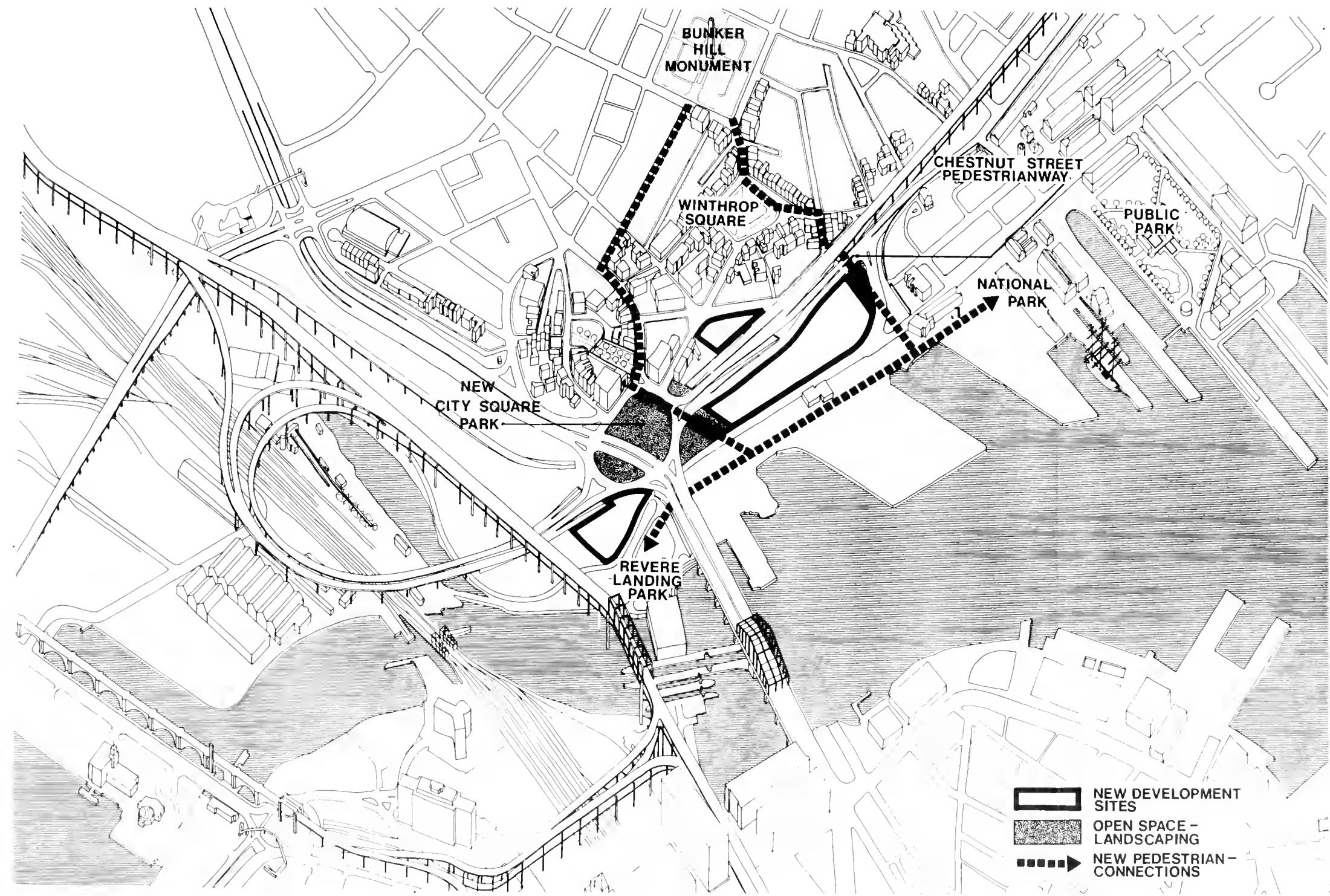
Figures V-24, V-25, V-26 show the land use and urban design possibilities which could result from implementation of Alternative 3 and its several surface street schemes. Each of these offers dramatic improvements in the surface street pattern, as well as new parcels for open space development and other amenities. New development parcels are also created for possible sale to private interests and subsequent development in new uses.

V.F SOCIAL IMPACTS

V.F.1 Criteria

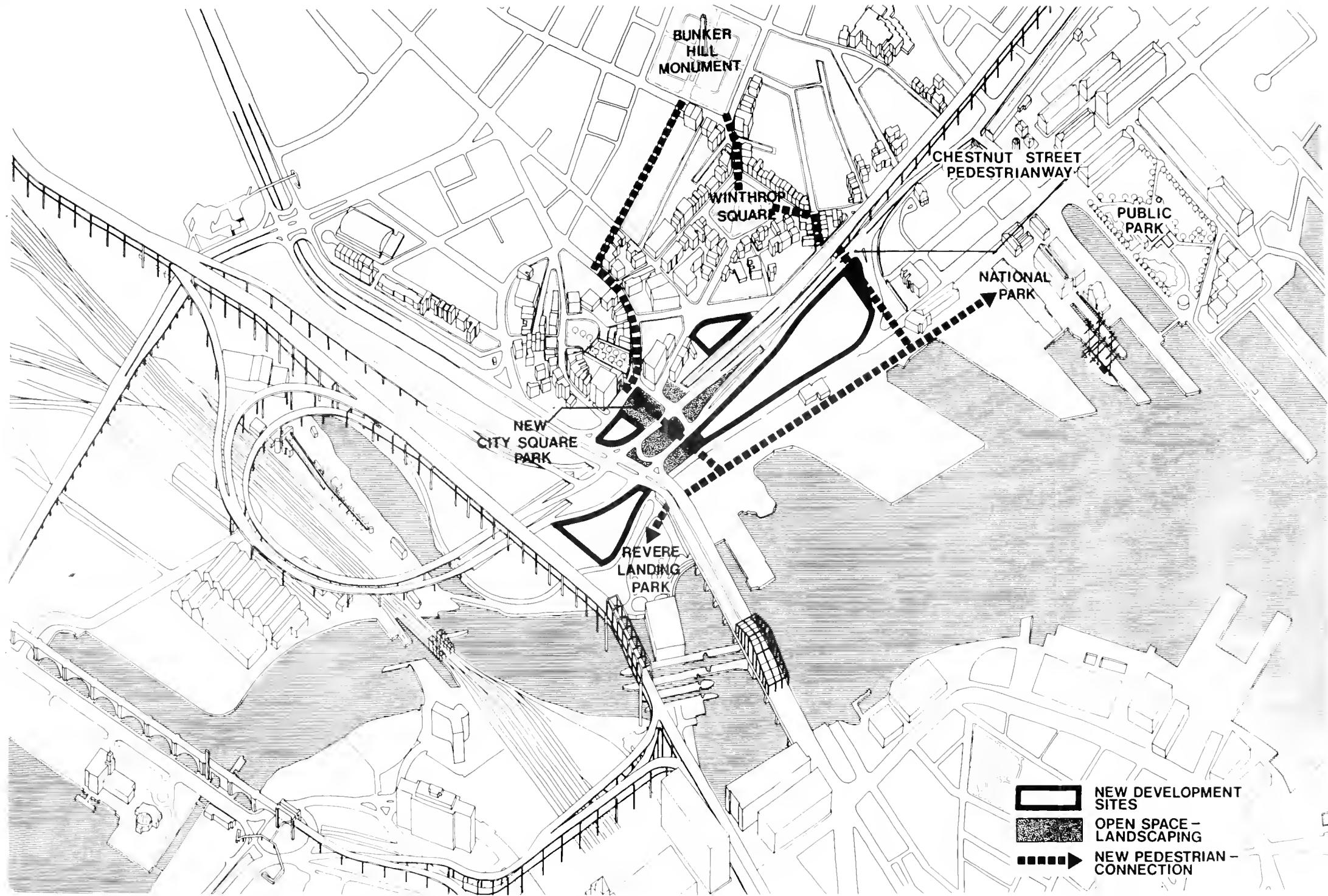
1. Impact on distribution of population: Over the long term, the addition of roadways has been one of the principal factors influencing the distribution and timing of population growth.
2. Physical takings: Takings may have a disruptive social effect by removing functional parts of the neighborhood; a local community center, playground, school, or housing.
3. Community cohesion: Construction of a major highway can cut a community in half, leaving two sections of the community. Residents can no longer move freely between the two sections as the highway may act as a barrier, cutting off the neighborhoods from valued resources such as parkland or schools. The road can also divide a once continuous neighborhood.
4. Disruption of ambient environment: Increased air pollution, noise levels, and traffic volumes may disrupt the residential character of a neighborhood.
5. Impact on neighborhood character: Road construction may have a deleterious effect on the character of a neighborhood which relies heavily upon social relations. By the same token, replacement or elimination of a road can have a positive effect on the neighborhood character.

ALT. 3A: URBAN DESIGN POSSIBILITIES





ALT. 3B: URBAN DESIGN POSSIBILITIES





ALT. 3C: URBAN DESIGN POSSIBILITIES

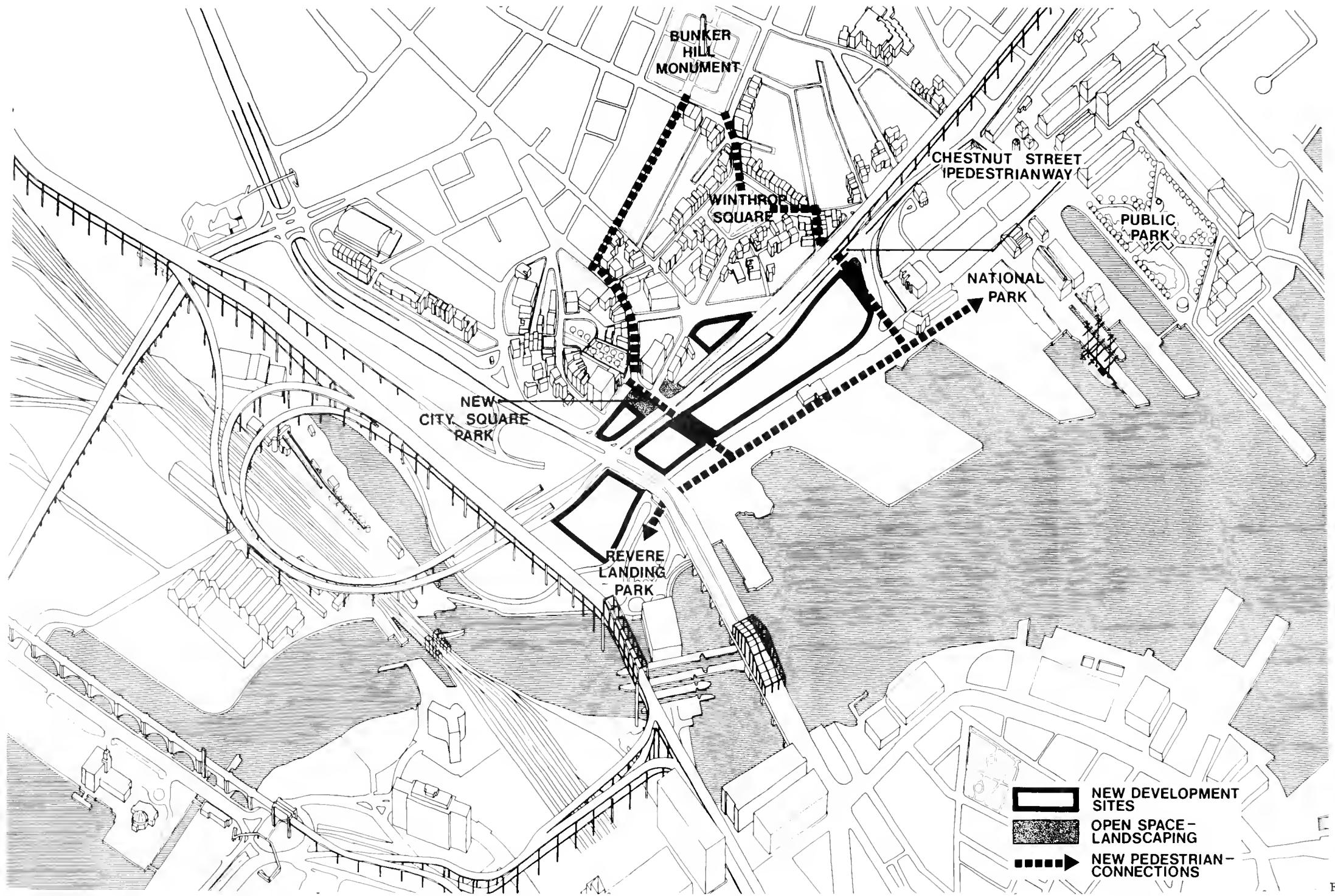


FIG. V-26

V.F.2

Existing Conditions

In 1972, Charlestown had an estimated population of 16,200 persons. Between the years of 1950 and 1960, Charlestown lost one half of its population. Between 1960 and 1970 the population decreased by 24%, while the city of Boston population decreased by 8% overall. At present, Charlestown and the city as a whole show an increasing population. The Boston Redevelopment Authority projects an average annual population increase of 4,893 persons for the City of Boston to the year 1985, of which 472 annually are anticipated for Charlestown. Project 1985 population for Charlestown is 23,600 persons.

Charlestown has traditionally been viewed as an ethnic Irish working class community. Forty percent of the resident population is of Irish descent, as compared to 22% for Boston overall.

The largest segment of the work force in Charlestown, according to the 1970 census, is involved in clerical occupations. A markedly small proportion (9%) of workers in Charlestown are involved in professional and technical occupations, as compared to the percentage in Boston, which is 17%.

The 1969 median family income for Charlestown was \$8,827. This amount was only \$306 less than the median for the City of Boston, which was \$9,133. Charlestown (with 25%) shows a larger percentage than the city (21.7%) in the \$7,000 to \$9,999 income range where its clerical workers income would occur. In the upper income areas, Charlestown's smaller percentage representation (39.6%; Boston, 43.8%) is also reflected in its comparative lack of a larger segment of professional, technical, and managerial workers.

Fifty-two percent of Charlestown families reported their primary source of income as wage and salary; 20% reported other sources of income; 17% collected social security; 9% were welfare recipients or other public assistance; and 2% were self-employed.

Charlestown's residential areas are virtually surrounded by a belt of industrial activities. Inside this perimeter exists a unique residential community made up of mostly older housing which reflects the rich history of the

area. Many of the houses are multi-family, often in row-house configuration. In Charlestown, 32.4% of occupied units are owner-occupied, while only 27.2% in Boston are owner-occupied.

Local realtors in Charlestown report that housing for sale and for rent has experienced increased demand from Boston's downtown workers. These persons are typically young professionals who are attracted by the lower rent and sale prices as well as by the charm of Charlestown. The newcomers are paying more than traditionally has been paid for housing in the area, and prices are rising accordingly. With the demolition of the elevated MBTA orange line, along with the construction of a neighborhood shopping mall in the Community College area, the desirability of housing in Charlestown should continue to rise. This increased desirability will be accompanied by higher rental and sale prices in some areas. The majority of the housing can be expected to stay in the hands of long-term Charlestown residents. This characteristic shows up in the proportion of residents who have lived more than 5 years in the same unit. This proportion rose from 52 percent to 64 percent between 1960 and 1970.

Charlestown is a stable, ethnic, working class community. Charlestown, especially the southwestern portion is a residential community with a historic tradition built over centuries into a distinctive cityscape. The area has a unique eighteenth and nineteenth century residential character that still exists only in some of the older eastern seaboard cities. The narrow residential streets, which are built into two gently sloping hills, are lined with continuous rows of old well built 2 and 3 story houses with harmonious facades designed in many architectural styles which give great attention to details. Occasional alleyways provide glimpses of backyard flower gardens. Residents consider Charlestown a pleasant place to live, and its qualities are very dear to the people who live there. It is the social characteristics that underlie neighborhood cohesion that keeps the population stable.

Community cohesion is an intangible but very real indicator of the quality of life in a neighborhood. It cannot be precisely measured,

but its strength and viability can be demonstrated through circumstantial evidence about social characteristics of the community and about the physical environment which supports it. There is, in addition, a sense of place and belonging which community cohesion implies for its residents.

Safe and unimpeded pedestrian access between dwelling units on different streets is a basic physical requirements for a viable neighborhood. The absence of physical and psychological barriers in a neighborhood encourages people to maintain close personal associations that underlie community cohesiveness. Both highway structures and rapidly moving traffic are physical, visual, and phychological barriers to safe, unimpeded pedestrian movement. By restricting street-level accessibility between neighbors. Such barriers reduce the range of associations which people can have.

V.F.3 Impacts

No Build Alternative

During redecking of viaducts some traffic will divert to local streets. Disruption will be of a temporary nature. When construction is completed, traffic will return to its normal pattern. The elevated structures, which have a disruptive social effect on the environment, will remain.

Alternative 2

Impacts are similar to Alternative 1.

Alternative 3

Due to the complexity of construction, Alternative 3 will cause the greatest amount of temporary disruption and social impacts. However, once completed, the impacts to the environment will be favorable. Elimination of the aerial expressway through City Square will end the barrier effect of the highway. Following completion of construction, the community will be reunited with the waterfront areas and City Square can again become a vital and integral part of the community.

V.G ECONOMIC IMPACTS

The economic impacts of the alternatives were evaluated at the local and regional levels. The No-Build alternative has no direct development impacts and provides limited construction employment benefits. Its indirect impacts are significant, however, in terms of economic development activity and employment inhibited or foregone. The economic impact of Alternative 2 is similar. By contrast, both the direct and indirect impacts of Alternative 3 are generally positive and would be an important stimulus to both the local and regional economy.

V.G.1 Criteria

Roadway construction in the project area can have numerous economic effects on both the short- and long-term economic growth to the community itself as well as to the sub-region and the region. Many of these impacts are measurable, although some which are clearly evident are not easily quantifiable. The following criteria are used to evaluate these effects:

Local Impact Criteria

1. Business displacement
2. Impact on local employment
3. Impact on existing business operations
4. Impact on local tax base and land values
5. Impacts during the construction period
6. Urban development opportunities

Sub-Regional Impact Criteria

1. Employment impacts--including:
 - effect on employment distribution
 - effect on employment opportunity and labor force accessibility
 - effect on manufacturing, retail, and wholesale industries, particularly as related to goods movement

Regional Impact Criteria

1. On-site employment
2. Off-site employment

V.G.2 Existing Conditions

Charlestown is recognized as a major employment center in the City of Boston. Only a small proportion of the jobs in the area are held by Charlestown residents. The warehouse/

industrial area of Cambridge in the North Area provides only a relatively small proportion of jobs in Cambridge and the North Area.

Warehousing and industrial activities are located in the Cambridge industrial area to the west of I-93, along Rutherford Avenue, and along the waterfront in Charlestown. Among the major establishments are Boston Sand and Gravel, H.P. Hood, Schrafft's Candy, two sugar refineries on Medford Street, U.S. Gypsum, and the Moran terminal. Over 100 business establishments are located along the principal arteries in the study area. City Square has traditionally been the locus of business activity in the community. In recent years, the closing of the Navy Yard and the general decline of the Square has caused many businesses to relocate elsewhere. Most local commercial establishments are now located along Bunker Hill Street, and a new shopping center is planned to be built near Community College Station.

Visitor attractions in Charlestown are becoming an increasingly more important component of the economic base in the study area. Existing attractions, such as the USS Constitution, the Bunker Hill Monument, and the Bunker Hill Pavilion, are luring greater numbers of visitors, primarily in the vicinity of the Navy Yard. The impact of these visitor attractions will be significantly greater when the new National Park is developed.

V.G.3 Impacts

The No-Build Alternative

The No-Build alternative will have little direct economic impact on the local community, though some 460 jobs which would result from the deck rebuilding could be expected to have a minor positive community benefit. Not all of these jobs would be in the construction industry. The indirect impacts of the No-Build alternative can be expected to be negative over a period of time. Increased traffic congestion would result from diversion of traffic onto local streets both during and after the construction period. While there are no takings for the No-Build alternative, the decline of the area due to increased traffic and the lack of opportunities for new development will have a negative effect on

employment, tax base and land values. This alternative could also inhibit complete development of the Navy Yard because of access problems.

On the regional and sub-regional levels, there are little perceptible impacts of this alternative. The slight positive effect of new jobs on the regional economy is offset by the continuation of the existing situation and the effects of this on local tax base and development opportunities.

Alternative 2

For an estimated project cost of \$7.5 million, Alternative 2 will create approximately 600 jobs. The modest positive impact of this employment locally and regionally is similar to Alternative 1. Other economic impacts on the tax base, development and non-project employment are similar to the No-Build Alternative. The slight improvement in traffic flow in City Square will not result in any perceptible change in the attractiveness of the area for development.

Alternative 3

This alternative provides the greatest potential economic benefits at the local, sub-regional and regional levels. Alternative 3 requires few property takings. The project is expected to increase land values in the City Square area and reinforce existing and potential development opportunities. Land now covered by the highway or directly impacted by its presence totals 11.1 acres. The land made available for development totals approximately 12 acres if the project (Alternative 3) is implemented. There are 21 additional acres which are indirectly impacted by the expressways, but which will be more readily developable if the overhead structures are removed. Most of the land which is made available for development is already in public ownership, thereby reducing land takings for the proposal. If the project is undertaken it is estimated that development (3.5 acres for parks and roadways, 8.5 for private development) would generate between \$2.5 - \$4 million in market value of land for new development. General community improvements and land development resulting from Alternative 3 will strengthen the tax base of the city, and provide new stability for the adjacent community.

This alternative offers significant benefits for the regional economy as well.* Construction of this project would generate \$184 million in the regional economy, as a result of the multiplier effect. These funds would in turn generate approximately \$10 million in new sales and income taxes. Some 6000 person-years of employment will be created. This will help reduce the present 33% unemployment rate in the state construction industry.

This alternative will also aid the regional economy by providing a significant reduction in societal costs of accidents in the area.

V.H WATER QUALITY IMPACTS

V.H.1 Criteria

A large number of physical, chemical, and biological criteria are used to evaluate water quality. The principal water quality impacts of relevance to the proposed North Area improvements are pollution caused by water run-off during and after construction, impacts resulting from filling, and relationship of the impacts of the proposed action to other efforts to improve water quality in the vicinity.

V.H.2 Existing Conditions

The three major areas where water quality conditions are pertinent to the proposed alternatives are the Charles River, a largely

*Estimates of regional economic impacts are based on the following:

- a. Money generated in the regional economy is based on a multiplier effect of 2.45 for each dollar invested in transportation capital improvements.
- b. Jobs generated, expressed in person-years of employment, are based upon a rate of 8,240 person-years of employment for each \$100 million of investment.

These factors have been derived from past studies of economic impacts, and are specifically reflective of the New England and Massachusetts conditions currently. They were developed for the Commonwealth by Prof. Eli Romanoff of M.I.T. in 1972.

filled branch known as the Millers River, and the area of the Inner Harbor immediately adjacent to the wharves in Charlestown.

At present, the Charles River Basin extends to the dam at Leverett Circle. Once the new dam adjacent to the Charles River Bridge is completed, the Basin will be extended 2250 feet downstream. The Millers River, which now flows into the tidal portion of the Charles River will later be contained behind the new dam. The Millers River once was part of the Boston Harbor. It has, however, been almost completely filled for industrial purposes, and the last remnant is presently adjacent to I-93. The current water quality of the Charles and Millers Rivers is Class SC*. Below the dam, the Charles River is a tidal river and is partly "flushed" twice daily. While this cleaning helps remove much of the material deposited in the river waters, the removal is not complete.

A number of related projects are currently underway which will improve water quality in the project area. The principal one is construction of the new Charles River dam, which will control infiltration of salt water into the Charles River Basin and improve navigation between the harbor and the river. Along with this, major construction efforts are underway to eliminate a number of sewage outfalls which presently discharge sewage and industrial wastes into the water from the B&M Railroad yards, Charlestown, and other sources along the Charles River. According to the Army Corps of Engineers, the outfalls will be relocated just downstream of the new dam to eliminate that source of pollution from the Charles and Millers Rivers.

V.H.3 Impacts

The No-Build Alternative: No significant changes in water quality will result from this alternative.

Alternative 2: No significant changes in water quality will result from this alternative. The one type of water quality impact which may occur would result from run-off

*SC: S = saline waters; C = suitable for boating and selected other activities

associated with construction and operation of surface street improvements at City Square. Surface street area, although redesigned, is not substantially altered over present conditions. In addition, construction of new surface streets would offer the opportunity to better control street run-off into the storm drain system leading to the harbor.

Alternative 3 has potential water quality impacts both during and after construction. Impacts during the construction period result principally from tunneling through City Square. While not necessary to the construction of this alternative, the Millers River Basin could be enclosed in a box culvert. This would require dredging and filling operations in the Millers River.

In general, tunneling has potential impacts on water levels and flows. In order to avoid adverse impacts, construction procedures and detailed designs will incorporate measures for maintaining the water level around the construction sites and for permanently providing for any necessary movement of ground water around the tunnels. It is not anticipated that the tunneling proposed for Alternative 3 will cause adverse water quality impacts. If harmful water effects result from surface run-off during construction, these effects will be minimized. Silt-ing will be dissipated by the use of temporary berms and dikes to direct the flow to sedimentation basins. Temporary ditches will be filtered by using bales of hay in a dam-type layout. In addition, the standards of the Department of Public Works regarding these protective measures will be followed.

The design for the loops of the traffic interchange proposed for the rail yard area of Cambridge will have to cross the Millers River. This body of water serves presently only the functions of draining and flushing of industrial and other wastes. The proposed improvements for the dam and for sewer outfalls in the area will substantially improve the quality of the water in the Millers River and the adjacent Charles River basin behind the new dam. Because of the minimal functions of the Millers River, it may be desirable to enclose it at a later date. However, this is not a part of this alternative.

Even though there are neither private wells nor public water supplies in the area, surface drainage on the completed project will be carried in closed systems to a point where there is no danger of contamination to adjacent lands. Location of drainage outfall(s) will be determined during the design phase of the project.

V.I. VEGETATION AND WILDLIFE IMPACTS

Existing conditions are compared to probable habitat characteristics if the alternatives were implemented. No significant effects are anticipated and no rare or endangered species are affected.

V.I.1 Criteria

Two criteria were used to evaluate impacts on vegetation and wildlife: physical removal of plant material and wildlife habitat, and the creation of an altered environment for the survival of plants and animals.

V.I.2 Existing Conditions

The area under study has long been developed and is not only urban in character but also nearly entirely paved over. Vegetation which exists is either maintained by people as part of a landscaping effort or grows as weeds in spite of adverse conditions. There are few street trees in the area, although some are being added as part of community improvement programs. Wildlife in the area is typical of urban waterfront land habitat entirely controlled by people. The following birds and wildlife have been observed in the area: Black-backed Gull, Brown-backed Chimney Swift, Common Tern, English Sparrow, Grey Squirrel, Herring Gull, Housemouse, Housewren, Robin, and Starling. No rare or endangered species are known to exist in the project area.

V.I.3 Impacts

The No-Build Alternative will provide no physical removal or alteration of wildlife or vegetation.

Alternative 2 may have minor impacts associated with surface street improvements at City Square. These changes will not affect

survival of existing flora and fauna. Land use changes and landscaping that would go along with this alternative offer opportunities to improve conditions.

Alternative 3 has no appreciable effects on vegetation and wildlife in the area. Landscaping and other improvements associated with Alternative 3 may afford some benefit. Anticipated impacts from noise and air pollution (V.C, V.D) are not expected to have any effects on survival of flora and fauna in the project area.

V.J. PUBLIC SERVICES AND FACILITIES

The facilities described in this section include public and semi-public facilities in the project area serving the neighborhood, region and nation. Impacts on public facilities may range from direct land takings to disruption of service areas and access to facilities. Those most sensitive to indirect disruption are ones that depend on a neighborhood service area where large numbers of users come on foot.

V.J.1. Criteria

The following criteria have been used to evaluate impacts on public facilities:

1. Physical displacement or disruption.
2. Change in access.
3. Physical separation.
4. Non-conformity with existing physical environment.
5. Disruption of ambient environment.

These criteria have been applied to the following categories of public facilities and services: Fire protection, police protection, schools, public lands or buildings.

V.J.2. Fire Protection

The existing fire station serving the southern area of Charlestown is at Winthrop Square. A new facility is needed and may be located on a new site.

Impacts

The No Build Alternative

Increased congestion could slow access from either the existing or a new facility.

Alternative 2

Particular access patterns for fire apparatus vary according to which surface street scheme is selected. However, in all cases, street configurations and directions will allow full access to the service area. As in Alternative 1, increased congestion could slow access.

Alternative 3

Street improvements made possible by the removal of the overhead ramps in City Square will improve the potential access of fire vehicles to their service area. Parcels of land made available with this alternative offer several possible sites for a new fire station. Both the location of the firehouse and detailed plans for street patterns can be devised to provide suitable access. The overall decrease in congestion on both expressways and surface streets as a result of Alternative 3 is a positive benefit for fire equipment access.

V.J.3. Police Protection

The existing police station serving the southern area of Charlestown is at City Square. Access from the police station to the Bunker Hill and Medford Street area is somewhat circuitous and subject to congestion at present.

ImpactsThe No Build Alternative

Increased congestion could slow access, especially during rush hours.

Alternative 2

Surface street improvements would increase police mobility by providing improved links to the service area. Without major changes to the expressway network, and with subsequent spillover onto local streets, congestion could lead to delays in service.

Alternative 3

Decrease in congestion resulting from improvements to both expressways and local surface streets are a major positive impact of this alternative. Specific local access patterns vary

according to the surface street pattern developed. The rotary allows the greatest number of access points to the street and expressway network, while other surface street options may allow more indirect connections. In any of the surface street options, street patterns can be developed to permit all necessary access.

V.J.4. Schools

There are two schools serving the immediate project area: the Kent Elementary School and the High School. Criteria used to evaluate school access includes traffic on streets between the schools and the residential areas they serve.

Impacts

The No Build Alternative

This alternative will lead to increased traffic on local streets.

Alternative 2

While increased traffic is expected result from Alternative 2, it will be localized in the Main and Park Street areas which will remain connected with the Joiner Street ramps. This could pose a safety problem for children walking to school. For this alternative, it has been assumed that little of the presently vacant land will be developed for residential use; therefore the impact of traffic is not expected to affect additional pupils crossing the streets in the area.

Alternative 3

Removal of the Joiner Street ramps, and the decrease in traffic in residential areas associated with them, will result in safer access for school children. This means that the Main and Park Street vicinity may become attractive for residential development because resident children will not have to cross heavy flows of traffic. There is a possibility that if the vacant land provided by the removal of the aerial expressway structure is developed for residential purposes, the school age population will increase. The pedestrian path in this alternative would provide safer access to school.

V.J.5. Public Lands

Ownership of potentially affected publicly-owned land is shown in Fig. V-27. The criterion used to evaluate impacts of publicly-owned land was the taking of the land or the prevention of use of the land.

Impacts

The No Build Alternative

This alternative involves no takings.

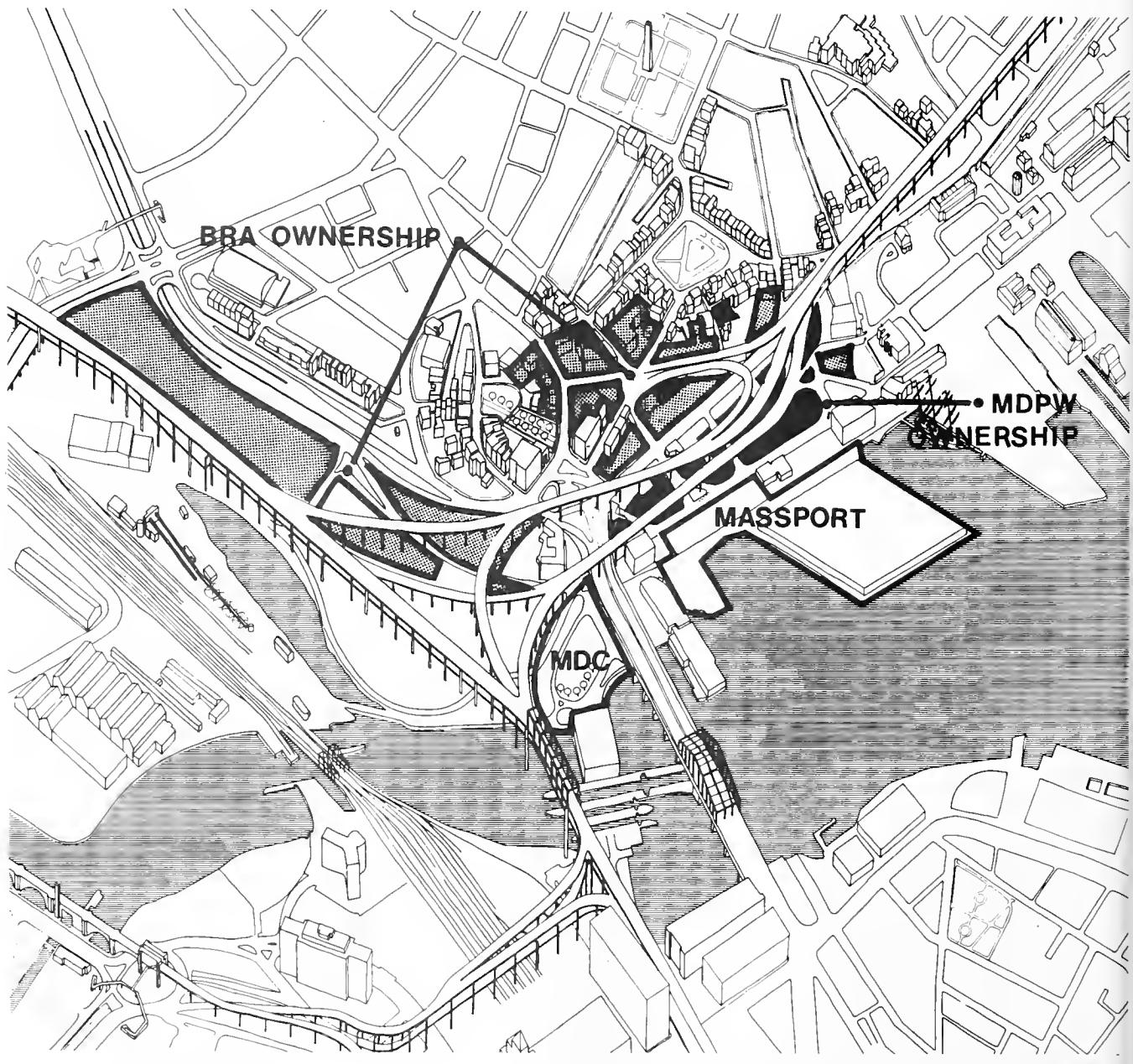


FIG. V-27

Alternative 2

The expressway improvements, as in Alternative 1, involve no takings. The local street alterations - Surface Street Schemes H, T, and M - affect only one area, City Square, where local streets and the City Square Park would be affected through proposed improvements.

City Owned Streets

Portions of Main, Park, Chelsea, Chambers, and Warren Streets, and Old Rutherford Avenue would be used for the new connections in City Square, under all of the proposed surface street schemes.

Located within City Square is a triangular grass plot with a World War II monument. The primary function of this plot is a traffic island. The monument will be preserved and relocated to another site within City Square.

Each of the Alternative 2 surface street schemes provide for the continued existence of City Square Park, at alternative locations resulting from street realignment proposals. No other public lands are required by Alternative 2 surface street schemes.

Alternative 3

Both expressway and local street alterations proposed for Alternative 3 involve takings of public lands.

City Owned Streets

Portions of Main, Park, Chelsea, Chambers, Front, Jenner, Mason, Joiner, Call, Gray, Foss, Henley, Hudson, Water and Warren Streets, and Old Rutherford Avenue would be used for the elements of Alternative 3, under the expressway plan and all surface street options.

City Square

City Square Park, as described in Alternative 1, is an area which is small and presently isolated from use by the surrounding neighborhood. The monument will be relocated, at the request of the City, to a location and consistent with a design approved by the City and the local community.

The Boston Parks and Recreation Department has stated that improvements are essential, and, if required by traffic considerations, a new site in the Square for the monument and the open space would be acceptable. Portions of the park as it now exists would be required for construction of the expressway tunnel connections between I-93 and the Mystic Bridge (Route 1). As part of the planned developments of new streets and amenities for City Square, the Park would be replaced in a large, improved form, with the monument reestablished in a location and design approved by the City Department of Parks and Recreation, and with community involvement in its design and relocation.

BRA - owned land

BRA parcels which are now scattered throughout the area, and which would be required by Alternative 3 are shown on Fig. V-27. These properties are not currently in use, and no active plans have been developed for their future. Replacement of these properties and reimbursement will be negotiated with the BRA.

DPW - owned land

Several parcels of land owned by the Massachusetts Department of Public Works are scattered through the area required by construction of Alternative 3. These lands are shown on Fig. V-27.

DPW - owned buildings

There are two DPW-owned buildings in the area proposed for construction of Alternative 3. The Water Street Garage located under the elevated expressway is the principal bridge maintenance facility for District 8 of the DPW. It includes the bridge maintenance section, and houses trucks and equipment for the District, along with small offices.

Another building - a so-called potato shed - is located behind the YMCA on Front Street. This shed is one of several in District 8 housing some personnel, trucks and other equipment, and also serves as a salt and sand storage area.

V.K. AESTHETIC AND VISUAL IMPACTS

Aesthetic and visual impacts of the alternatives are discussed from the points-of-view of local residents and pedestrians, both residents and visitors.

V.K.1 Criteria

The following criteria have been used to test the visual and aesthetic impacts of the alternatives:

- a. The compatibility of changes in elements of the existing natural or man-made environment with the special character of the area;
- b. Changes in use or special character which make a particular area a valued resource.

V.K.2 Existing Conditions

Principal aesthetic and visual features at present are the imposing overhead highway structures and the confusion at street level caused both by supporting columns and the local street network. These structures are out of keeping with surrounding land uses and they obscure views of the waterfront. These problems are compounded by the division between sections of the community imposed by both the mass of local streets in and around City Square and the overhead highways. Removal of the Orange Line elevated structure has improved City Square and is an indication of improvements which are possible.

V.K.3 Impacts

The No Build Alternative

For Alternative 1, there will be no substantial change from the existing conditions.

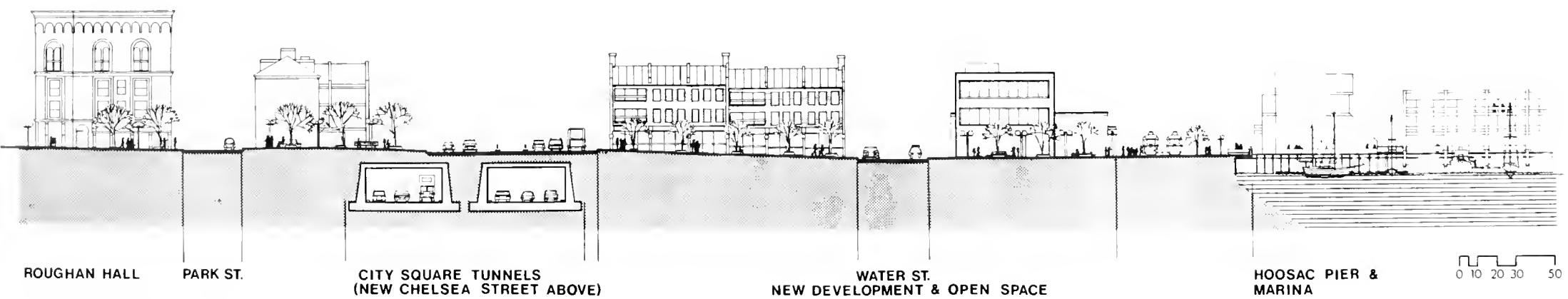
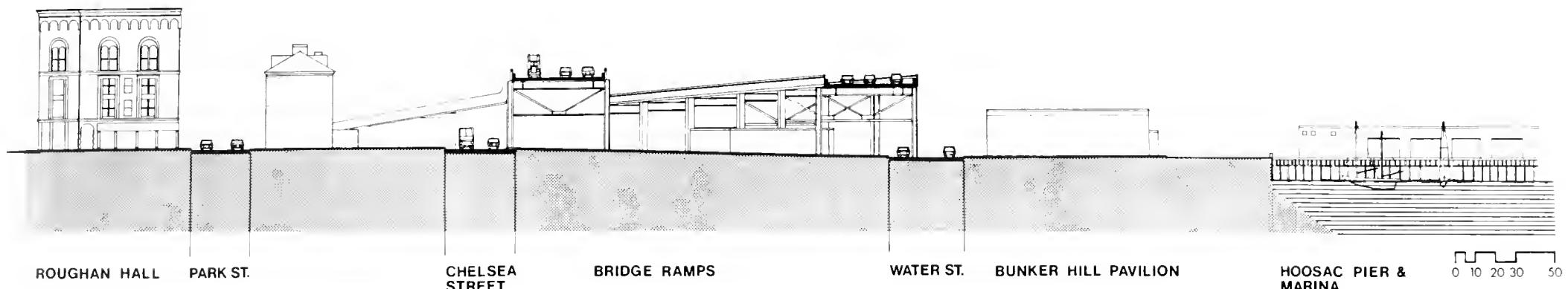
Alternative 2

Like Alternative 1, there will be no substantial change from existing conditions. Surface street improvements offer only modest opportunities to improve the aesthetics of the area.

Alternative 3

Alternative 3 will produce major improvements by removing the elevated highway and supporting columns. This will offer the potential for additional improvements to the aesthetic and visual environment through open space, landscaping and structures in keeping with scale and needs of the community. Views will open from the community to the harbor. In addition to the visual improvements, there will be opportunities for pedestrian pathways through more attractive and unobstructed areas. In City Square the tunnels will remove the expressways from view; however, in the areas where the Mystic Bridge descends into the tunnel, a new walled section will obstruct views and passage between the community and waterfront. However, these views are presently obstructed by the existing structures. New structures for the expressway interchange will be erected in the rail yard area. This area is presently industrial so that ramps are more compatible than they would be with other land uses. In addition to removing the highway, major aesthetic and visual improvements will come about as a result of new development and urban design programs associated with the transportation improvements.

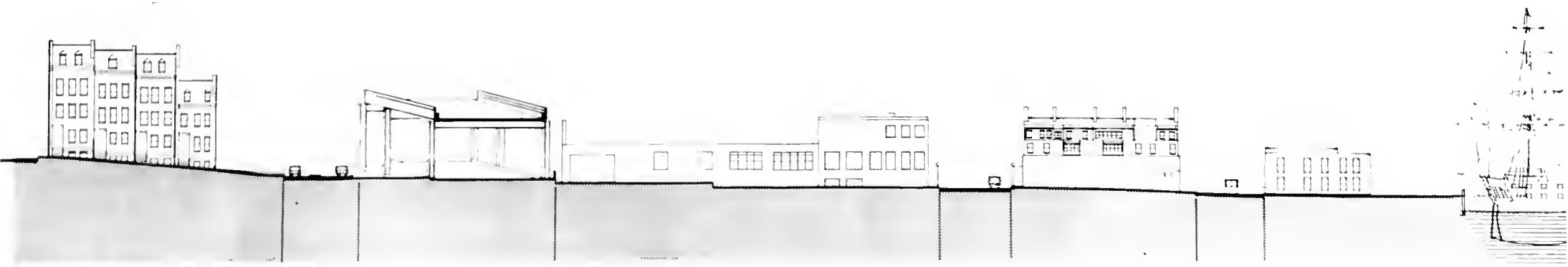
CROSS SECTION: CITY SQUARE



ALTERNATIVE - 3

CROSS SECTION

CHESTNUT STREET



EXISTING

0 10 20 30 50

CHESTNUT STREET

LOWNEY
WAY

MYSTIC BRIDGE

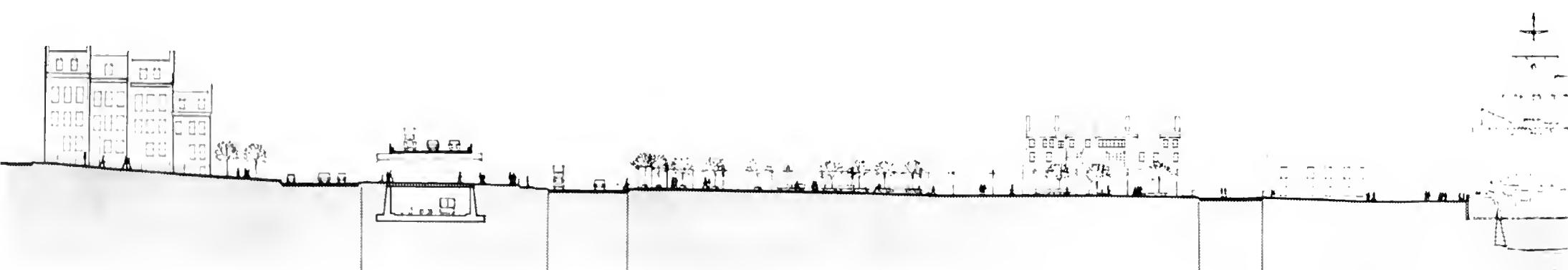
NEW
CHELSEA
STREET

NATIONAL PARK

GATE 1

0 10 20 30 50

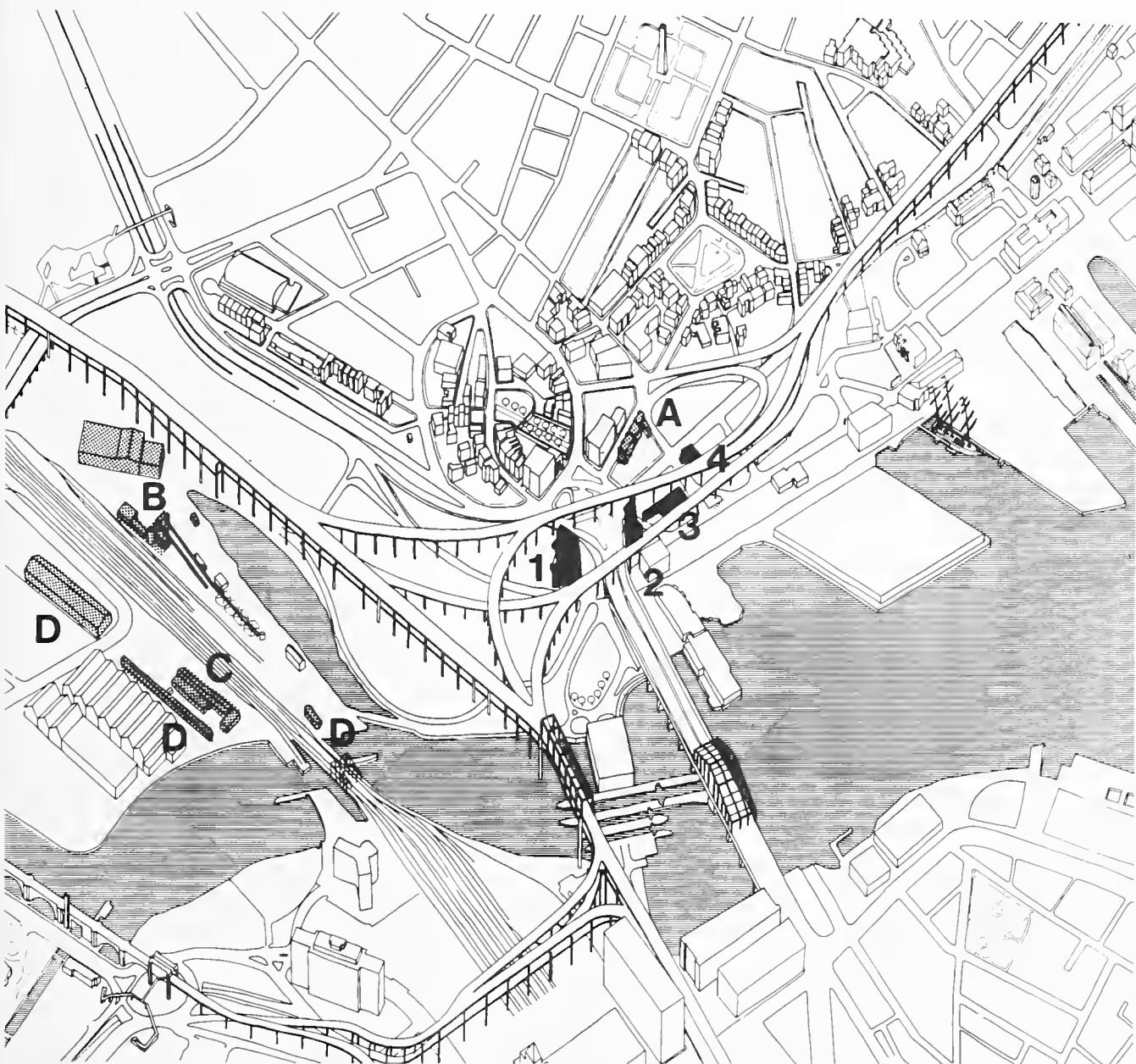
ALTERNATIVE 3





PROPERTY ACQUISITION

Property acquisition for transportation improvements is an extremely sensitive subject with the community. Plans for North area improvements have been developed so as to minimize the taking and disruption of private property. Most of the land to be used is in public ownership (chiefly properties owned by the Massachusetts Department of Public Works, and the Boston Redevelopment Authority). Land ownership along the proposed improvement corridor is shown in Fig. V-27.

**AFFECTED STRUCTURES - ALT. 3**BUILDINGS TAKEN

- 1 - YMCA
- 2 - Vacant Building
- 3 - MDPW Maintenance Bldg.
- 4 - Doherty's Pub

BUILDINGS AFFECTED

- A - Park St. Houses
- B - Boston Sand & Gravel
- C - Mixed Ownership
- D - Boston & Maine R.R. Bldgs.

FIG. V-30

V.L.1. Description of Properties and Impacts

Alternative 1: No property acquisition is required for this alternative.

Alternative 2: No private property acquisition is required for this alternative.

Surface street improvements in City Square, under all schemes, will require the re-parcelization of street space, traffic islands, parking areas, and the grass plot in the center of the Square. (See Section V.E. the Fig. V 21-23 for the street schemes and reparcelization of the vicinity).

Alternative 3: Private property takings for Alternative 3 have been kept to a minimum. No residential takings are required. There are, however, two commercial takings and one institution affected by the proposal. These are described below, along with three options prepared by the Department of Public Works, Right-of-Way Bureau are:

Option 1 - acquire all parcels of land in fee, all buildings; demolish the buildings and relocate all occupants. The estimated cost is \$4,020,000 for acquisition and demolition, and \$550,000 for relocation.

Option 2 - take air rights and easements only, together with making minor changes to buildings to accomodate the overhead structure, viaducts and bents. No improvements are to be taken from Boston Sand and Gravel Co., Boston and Maine Railroad Co., Mussolini Loconte Co., Cosite Co., and T.A. Cosco Trust. The estimated cost is \$1,848,000 for acquisition and demolition and \$115,000 for relocation. Representatives from the Department's Bureau of Right of Way have had discussions with all affected land owners.

Option 3 - is the same as Option 2, except that all land would be taken in fee, and provision made, by taking highway easements, to retain all improvements, by altering them to accomodate the overhead structure and viaduct bents. Any fireproofing of improvements is not included in this estimate, and railroad track locations, normally included in MDPW force account agreements, are also excluded. The estimated cost is \$2,699,000 for acquisition and demolition and \$115,000 for relocation.

At the present time, Option 2 has been tentatively selected as the most appropriate procedure to be followed.

V.L.2 Privately Owned Buildings to be Acquired

Public buildings to be acquired are described in Section V.J. Private buildings which must be taken for Alternative 3 include 1 tavern, 1 institution, and 1 vacant building.

Tavern: This is an establishment where liquor is sold and consumed on the premises. It occupies a one story brick building approximately 40' x 60' and employs three people.

Non-Profit Organization: (YMCA) This non-profit organization occupies a five-story brick building containing 167 sleeping rooms, and employs 35 full time employees. The organization serves military personnel and the people of the community. It occupies approximately 27,000 square feet of land which includes limited parking facilities.

Vacant Building: This building is located at the corner of Chambers Street and the Charlestown High Bridge. It is a three story structure and has been vacant for many years.

V.L.3 Relocation Requirements

Tavern

Drinking establishments may retain their liquor licenses for a period of four years from the date of their physical dislocation,

and retain the right to transfer the license to new quarters. However, finding a new location in Charlestown, or in any other neighborhood in the City of Boston is inhibited by neighborhood resistance to new liquor establishments. According to Charlestown realtors, it should not be difficult to locate suitable rental or sales space for relocation, but it appears the major problem to be anticipated is the transfer of the liquor license which may be opposed by members of the community.

YMCA

In order to relocate this organization it would be necessary for them to acquire vacant land and construct a new building. Land is presently available, in the community that would suit the needs of this organization. These include the following.

The Boston Redevelopment Authority has indicated that it is their intention to develop land now owned by the M.B.T.A. into an industrial park. The subject land contains 26 acres and is located in Sullivan Square, Charlestown, bordered by Alford Street, Arlington Avenue and Mystic Avenue.

Other vacant land located in Charlestown, owned by the B.R.A., that could be utilized for replacement property is as follows:

1. 268,628 square feet, bordered by Rutherford Street, Austin Street, Main Street and West School Street.
2. 39,285 square feet, bordered by Rutherford Avenue, West School Street and Lawrence Street.
3. 16,935 square feet, bordered by Rutherford Avenue, Allen Street, Main Street and Thorndike Street.

Potential Additional Displacements

West of I-93 three businesses may be displaced, although present plans do not require their acquisition. All three occupy warehouses. Two are engaged in wholesale grocery activities, and the third in general freight. One occupies approximately 20,000 square feet and employs 12 people. Another occupies approximately 15,600 square feet and employs six people. The third occupies approximately 14,000 square feet and employs 5 people.

At this time, plans do not require relocating these businesses, but they may be subject to temporary disruptions caused by installation of columns and other work necessary to construct the ramps in the area.

If relocation becomes necessary the business would require locations in proximity to transportation depots. Such replacement sites are presently available.

A coffee shop occupies approximately 10' x 25' of one of the aforementioned warehouses. It is managed by the owner and employs one person.

V.M. ARCHEOLOGYV.M.1 ImpactsAlternative 1

Alternative 1 will have no affect on either prehistoric or historical archeogoly.

Alternative 2

This alternative will have no effect on either prehistoric or historical archeology.

Alternative 3

Much of the land to be used for the Central Artery improvements in the North Area has been greatly disturbed by construction and fill since the time of the first historic period settlement. A preliminary archeological study by the Department's archeologist indicated that it is doubtful that any undisturbed prehistoric sites will be impacted by the proposed construction. Of course, there is always the possibility that undisturbed prehistoric remains lie under those areas filled by man in the past 300 years. (For example, the famous Boylston Street fish weir, dating to approximately 4,000 years ago, was discovered in the Boston Blue Clay during the excavation for a building site.) Therefore, it appears the present degree of land disturbance probably negates the need for a prehistoric archaeological survey prior to construction, but during that construction careful attention will be given to the possibility of uncovering prehistoric material. This will be addressed in the special provisions of the construction contract.

The historical sensitivity and significance of the area presents a different problem from that discussed above. There is a distinct possibility that the proposed construction will have an impact - either direct or indirect - on historical resources.

In view of this, the DPW staff archaeologist has suggested that an historic archaeological survey should be made in the area as part of basic design in order to determine what cultural resources may be present, how the project might impact them and how any such impacts can be mitigated.

V.N. UNAVOIDABLE ADVERSE IMPACTS

Unavoidable adverse impacts include all negative impacts which are necessary consequences of following a given course of action and which cannot be significantly reduced through measures to minimize harm.

V.N.1 Transportation Service

The evaluation of unavoidable transportation impacts is based on the traffic increases projected for 1980 and 2000.

Alternative 1: No-Build

With this alternative, traffic congestion and accidents will increase on the expressways and in and around City Square. The Henley Street ramp to the expressway will remain closed to peak hour use by Charlestown residents.

New uses of land in the vicinity will remain improbable because of the inability to provide new or improved access. Access to the National Park and other proposed uses in the former shipyard will be difficult and circuitous, thereby limiting the capacity of the area to handle projected increased visitation and use of the Shipyard area.

Alternative 2

With the exception of minor improvements in traffic service within City Square, this alternative is similar to Alternative 1.

Alternative 3

Unavoidable adverse impacts for this alternative occur during the construction period.

V.N.2. Noise

Alternative 1: No Build

There will be a temporary increase in noise levels during construction.

Alternative 2

There will be a temporary increase in noise levels during construction.

Alternative 3

There will be some slight increase in noise levels at areas which include: (1) the Lynde Street area; (2) lower Old Rutherford and Harvard Avenues; (3) areas abutting steep grades on Mystic Bridge approaches, such as Lowney Way. While all of these areas presently experience noise levels significantly in excess of the Design Noise levels of FHPM 7-7-3 and will continue to do so regardless of which project alternative is chosen, only in the area of Lowney Way does Alternative 3 create any potentially noticeable increase in noise levels. Much heavy construction equipment produces noise levels as high as 92 dBA at 50 feet. Assuming daytime operation only, this can cause a significant noise impact upon residences and schools at a distance of 800 feet. Significant intrusive noise impact is taken here as 65 dBA or more. If severe noise impact is taken as 75 dBA or more, this can result from heavy road construction equipment closer than about 300 feet. (It may be noted that the criteria used here are 5 dBA higher than used elsewhere in the study for traffic generated noise. This is because construction noise is of a limited duration.)

Estimates of construction noise levels that would cause adverse impact, as well as approximate distances from equipment beyond which adverse noise effects would not be expected, are summarized in Figure V-31.

New developments in the area of construction noise abatement may be successful in reducing noise at the source to 85 dBA. At the time of preparing contract documents, noise abatement would be made a part of the contract specifications. Emphasis would be on performance with the contractor given the freedom to select the most advantageous method of meeting the performance specifications. However, it would be necessary to determine whether the specifications can in fact be met by the state-of-the-art technology.

Fig. V.31
Highway Construction Noise Abatement
Guidelines for Residential Areas.

<u>Noise source</u>	<u>Significant Impact</u>	<u>Severe Impact</u>
General construction (daytime)*	800 feet, 65 dBA	300 feet, 75 dBA
Rock drills (daytime)	1500 feet, 65 dBA	700 feet, 75 dBA
Rock drills (nighttime)	2000 feet, 65 dBA	1000 feet, 75 dBA

* Excluding pile drivers

Source: Parrack, H.O., "Community Reaction to Noise"

V.N.3 Social Impacts

Alternatives 1 and 2 foster worsening environmental conditions for residential areas, as traffic levels increase.

V.N.4. Economic Impacts

Alternative 1: No-Build

The major negative economic impacts of this alternative lie in the constraints it imposes on growth of activity in the City Square area. Potential jobs, income, and tax revenues are also foregone.

Alternative 2

Similar to Alternative 1, with the exception that City Square may regain minor potential development possibilities through the realignment of local streets.

Alternative 3

Implementation of Alternative 3 will result in taking one tavern, one vacant building and one institution. Three jobs from the tavern would be lost, and 35 from the institution--the YMCA. In both cases it is possible that the facilities can be relocated in the immediate area, if the operators of the property wish to do so.

V.N.5 Public FacilitiesAlternative 1

Alternative 1 has no unavoidable adverse impacts on public facilities, except in so far as traffic increases over time, when access will be more difficult and hazardous.

Alternative 2

Alternative 2 will result in the temporary displacement of City Square Park, to allow construction of new transportation facilities in the area. The park will be replaced in a new location upon completion of construction, but during construction it will not be available for public use.

Alternative 3

Alternative 3 requires taking of the DPW maintenance center on Joiner Street, the storage shed behind the UMCA and several local city-owned streets. Vacant lands owned either by the BRA or by the MDPW will also be required to be taken. New land will be available for public facilities and other development with acreage substantially in excess of that required by the project. Alternative 3 also requires displacement of City Square Park.

V.N.6. Impacts during constructionAlternative 1

This alternative, has short-term impacts of 1 year associated with construction. This includes traffic disruption, environmental impacts such as increased air pollution caused by traffic disruption and spillover and noise, dust, dirt and other environmental impacts caused by construction activity. However, most of these impacts will be caused on the existing structure of the expressway and on ramps and surface streets in the immediate vicinity of the expressways.

Alternative 2

This alternative has short-term impacts of one year associated with reconstruction of decks on the expressway viaduct and street improvements in City Square. This includes traffic disruption and spillover, and noise, dust, dirt, and other environmental impacts caused by construction activity. Impacts

will be localized on the existing structure, ramps, surface streets in the immediate vicinity, and City Square.

Alternative 3

This alternative has short-term impacts of 3 years duration associated with construction, including traffic disruption to expressways and certain local streets; short-term environmental impacts of noise, dust, dirt, air pollution, and erosion; temporary closing of City Square Park for public use and some local streets.

Traffic disruption impacts vary according to the phase of construction activity. In certain phases, local streets will be temporarily closed or used for detoured through traffic in order to provide for all the access currently available in City Square. During phases when new expressway elements are being constructed, short-term impacts to existing expressway traffic are expected to be minimized because more expressway capacity (2 lanes in each direction at all times) will be available. Traffic impacts on local streets are expected to be greater in the short-term due to the complex construction staging pattern.

During certain stages of construction, the off-ramp from the Mystic Bridge to City Square will be removed and this access will not be available for approximately one year. Traffic currently using this ramp will be required to continue to either the Nashua Street area or Haymarket.

Short-term environmental impacts result from construction activity which is spread over a larger area than in Alternatives 1 and 2, for a longer period of time, and at a more intensive level. These extend from the Prison Point Bridge and the industrial area in Cambridge to the Mystic Bridge. However, immediate impacts on residential properties are only in City Square and adjacent connecting streets, these as a result of construction of the tunnel under the Square.

MEASURES TO AVOID AND REDUCE IMPACTS

The measures described here will help to minimize impacts from the alternatives by removing the cause of the impact or by lessening its effect. These include measures to be taken in the design of improvements in order to lessen their impacts that will result after the improvements are made, as well as special construction procedures and safeguards to alleviate impacts during the construction period. Each of these classes of measures is described separately for each alternative in the following sections.

Measures to be used in Design

Alternative 1

No practical measures can be taken to minimize impacts of increases in traffic volumes, congestion and delay over time and their transportation and community impacts.

Alternative 2

As in Alternative 1, there are no practical measures to minimize the impacts of traffic, which over time will increase congestion and delay on the expressway facilities. However, the design of the new surface street facilities at City Square has been carefully undertaken to avoid any takings of private property.

Alternative 3

Alternative 3 has been designed and located to minimize adverse community impacts and takings. The connection from the Mystic Bridge into the tunnels under City Square has been designed to avoid taking residential properties. In the industrial area the design of the overhead ramps straddles existing operations and the taking of existing structures and operations has been avoided by this design.

Noise impacts of Alternative 3 will be minimized through the addition of noise barriers and landscaping measures adjacent to residential areas. Particular measures will be undertaken at the northern edge of the ramps approaching the Mystic Bridge, and at the ramp northbound on to I-93. Water runoff impacts will be minimized through design incorporating a closed drainage system.

V.P. SHORT-TERM USES VS. LONG-TERM PRODUCTIVITY
OF THE ENVIRONMENT

This section discussed the extent to which proposed alternatives involve trade-offs between short-term environmental gains, at the expense of long-term environmental losses, and a discussion of the extent to which proposed alternatives foreclose future options. The word short-term refers to the immediate effects of the alternative, while long-term refers to the period over which the direct or secondary effects of an alternative are apparent.

Alternative 1

Alternative 1 has the following short-term gains at the expense of long-term productivity of the environment: First, replacement of the decks will maintain the existing structure of the expressway and allow for its short-term use, but at the cost of increased accidents, congestion and delay over time because the basic defects in the interchange remain over the long-term. The long-term environmental effects of increased congestion are greater air and noise pollution resulting from delays, more spillover of traffic onto local streets, and the disruptive effects of increased traffic on the man-made environment. Second, replacement of the decks on the expressways inhibits potential development of lands adjacent to the existing expressway structure. This alternative does not foreclose options for major improvements in the future, but does require the investment of \$5,600,000 in the short-term if nothing else is done.

Alternative 2

Alternative 2 is very similar to Alternative 1, in terms of its short-term gains in deck replacement and maintaining the expressway structure. As in Alternative 1, this is at the long-term cost of increased traffic and associated environmental impacts, as well as inhibiting development in the area. Surface street improvements in City Square are a short-term gain, in so far as making minor improvements in access and local circulation for the local community. The long-term impact is that it is not a lasting solution to the local circulation problems. As in Alternative 1, major improvements in

the future are not foreclosed, but Alternative 2 requires the expenditure of \$7,500,000 in the short-term if nothing else is done.

Alternative 3

Short-term gains from Alternative 3 at the expense of long-term productivity are limited to the area west of I-93, for the most part. In that area, which is principally industrial, the proposal calls for new elevated expressway structures. In the short-term, these are compatible with the existing land uses. The presence of the structure will probably limit the area to industrial uses over the long-term. Land uses that are more sensitive to transportation impacts may be precluded from this area.

Throughout the North Area, the implementation of Alternative 3 would represent a major short-term gain for the environment. The individual elements of the alternative do not preclude subsequent transportation improvements, either to the highway network or to public transportation service. The design of the proposed interchange between the Mystic Bridge, the Central Artery and I-93 in the industrial area has been carefully planned to allow subsequent improvements to the expressway network, should they become necessary or desirable; these improvements could include future improvements to I-93 in the downtown area. At the same time, the proposed plan does not hinder public transit improvements which may become desirable; the proposed elements carefully bridge existing rail lines - both subway and commuter - and allow for further improvements not only to the rail network but for bus services which may become desirable.

V.Q.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT
OF RESOURCES

Alternative 1

This alternative perpetuates the existing conditions and implicitly commits the community, the state and city to the same and increasing traffic over time, not changing the structures and the impacts they have on the community, and to the use of land and other resources for transportation facilities instead of other developments more compatible with and productive to the community.

Further traffic management measures may be necessary if traffic grows as predicted. This alternative implies a judgment that potential benefits of transportation safety and service improvements, and the community benefits as a result of more significant actions are not worth the investment of public monies at this time. However, it does commit the state and the community to the expenditure of funds to replace the existing decks at a date not too distant in the future. This alternative preserves the option of making transportation service or other improvements at a time in the future, but with a capital expenditure for deck replacement within 10 years.

Alternative 2

As in Alternative 1, there are several consequences of continuing existing conditions, and the commitment to making only minor improvements in local transportation facilities. The improvements in surface streets in the City Square area have the added consequence of postponing the possibility of a more far-reaching solution to the expressway and local difficulties of the area. While more significant improvements are not precluded by this alternative, greater investments in the immediate future are required to make this modest improvement in local circulation; if a more major solution is necessary in the future, this commitment of resources then becomes lost.

Alternative 3

This alternative will require additional commitments to construction materials, public funds, and of existing public streets, land and property for right-of-way; these would be lost to other foreseeable uses.

At the same time this investment would result in improving transportation service, safety, and the creation of major opportunities for new development and upgrading of community quality. It implies a judgment that the potential benefits of a major public investment at this time outweigh the costs of maintaining the existing system and perpetuating existing conditions.



VI

ANALYSIS OF POTENTIAL SECTION 4(f) ISSUES

CHAPTER VI. ANALYSIS OF POTENTIAL 4(f) ISSUES

In order to assure compliance with Section 4(f) of the Department of Transportation Act of 1966, as amended, this chapter identifies potential issues associated with certain types of properties which might be used by the proposed North Area improvements and which are entitled to special protection under a required review procedure. In the North Area, one property has been identified as a potential Section 4(f) property. That property is City Square Park in Charlestown. A letter from the Parks and Recreation Department of the City of Boston, found on pages 138 and 139, contains that Department's determination that City Square Park is not significant for purposes of Section 4(f). The Federal Highway Administration therefore considers that Section 4(f) does not apply to this parcel.

VI.A Description of Project and City Square Park

Of the three alternatives for North Area improvements, Alternatives 2 and 3 may potentially affect City Square Park. Alternative 2 would reorder the local street pattern and would change the configuration of the site. Alternative 3 would require construction of tunnels in the vicinity of the site and would reorder the surface street pattern and parcelization of land in the Square, including the site. These alternatives are illustrated in Chapter IV.

Description of the Site: City Square Park consists of a small grass plot with a World War II monument, several shrubs and three aging benches. It is located at the center of a heavily-used traffic circle and is overshadowed by elevated ramps serving the Mystic River Bridge and I-93.

Size: The total area of the site is approximately 8,500-9,000 square feet. The location of the site is shown in Figure II-2.

Type: The site is an ornamental passive open space.

Facilities Existing and Planned: Existing facilities are two benches without seats and one bench with seat; no additional facilities are planned.

Usage: passive open space which receives little or no use.

Relationship to other similarly used lands:
one of many traffic islands in the Square;
no direct physical or functional relationship
with any other parks.

Access: pedestrian access only by crossing
through heavy traffic; vehicular access on all
sides.

Ownership: City of Boston, under the juris-
diction of the Department of Parks and
Recreation.

Applicable clauses affecting title: none

Unusual characteristics: serves as a traffic
island; in shadow of overhead expressway ramps;
combined factors of size, location, access,
and deterioration render it essentially useless.

Location and amount of land to be used by
alternatives: In alternative 1, the parcel
is not affected. In alternative 2, the parcel
is taken for a revised street pattern, includ-
ing new landscaped traffic islands. In alter-
native 3, the parcel is taken for new streets
and public open space. In either alternative
2 or 3, the World War II monument will be moved
to a more suitable location in City Square.

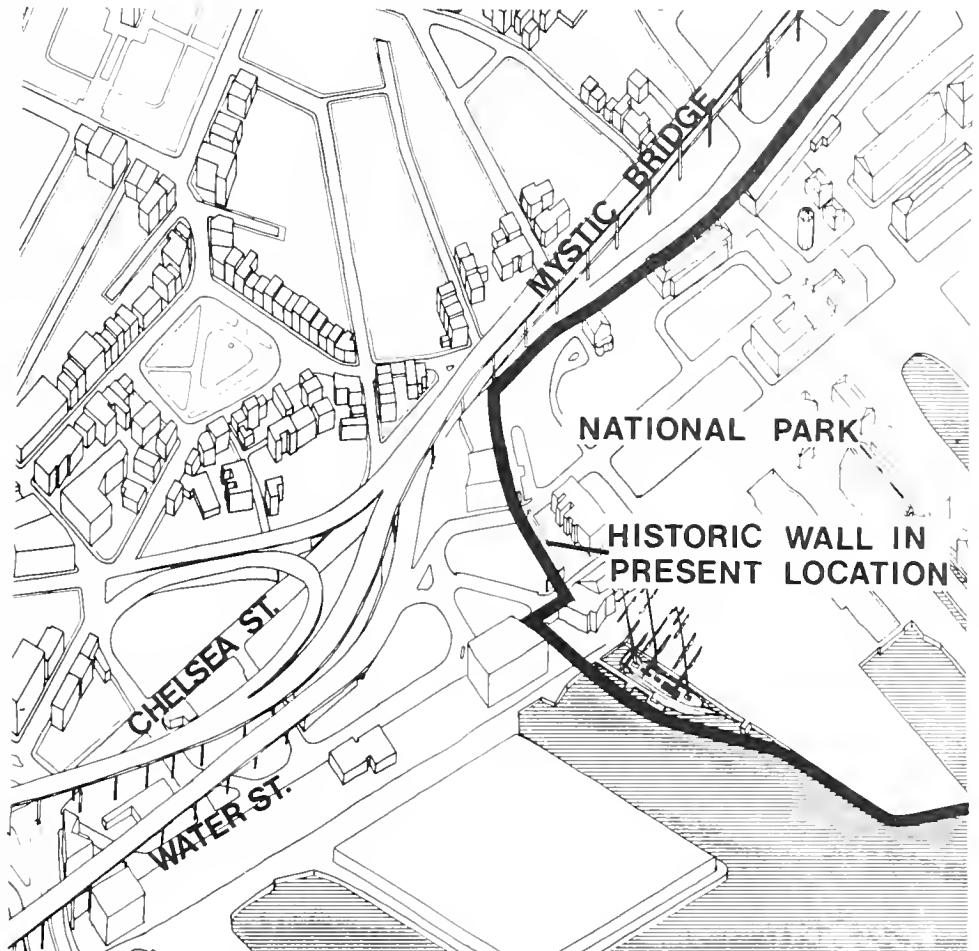
Facilities affected: parcel and appurtenances.

VI.B. Chelsea-Water Streets Connector

The surface street schemes of Alternative 3
(A,B, and C) provide for connections into the
proposed Water-Chelsea Street connection, which
is expected to be completed first. The Water-
Chelsea Connector has Section 4(f) and Section
106 impacts which have been addressed in the
Draft Negative Declaration for that proposal*
and which will have been resolved within the
context of that proposal.

For information purposes, a series of maps are
included on pages 135-137. They illustrate
the relationships between the Water-Chelsea
Connector and the elements of Alternative 3
which connect with it.

*Draft Negative Declaration, Chelsea-Water
Streets Connector, Little Mystic Channel Cross-
ing, Charlestown, Boston, Massachusetts, U.S.
Department of Transportation, Federal Highway
Administration, Massachusetts Department of
Public Works, 1977, (unpublished draft).

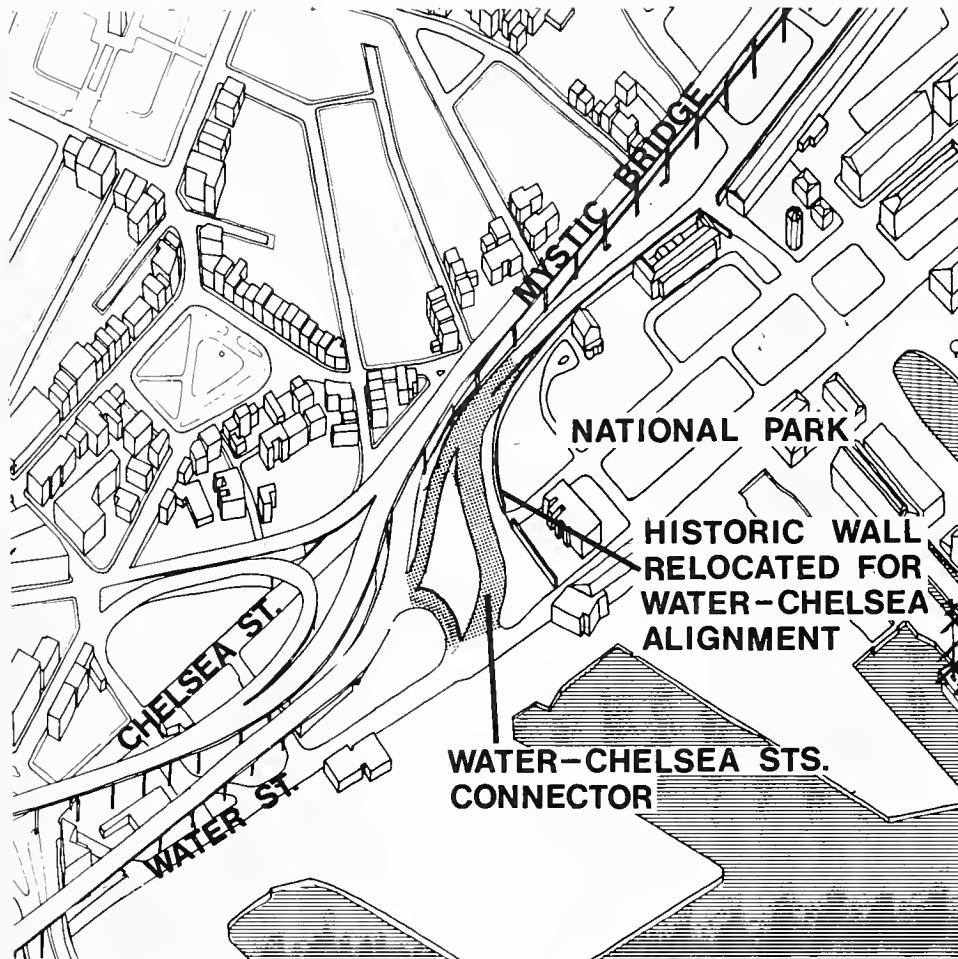


EXISTING CONDITIONS

Figure VI-1

In the existing situation, Chelsea Street provides access only to the lower deck (northbound) of the Mystic Bridge and from Lowney Way (on the north side of the Bridge). Water Street gives access to waterfront properties and an exit ramp from the Bridge approaches. Chelsea Street and Water Street are not connected except by cross streets such as Joiner Street, close to City Square.

The Naval Shipyard, now a National Park, contains historic structures, including an ancient stone wall which would be affected by the proposed connection between Water and Chelsea Streets.

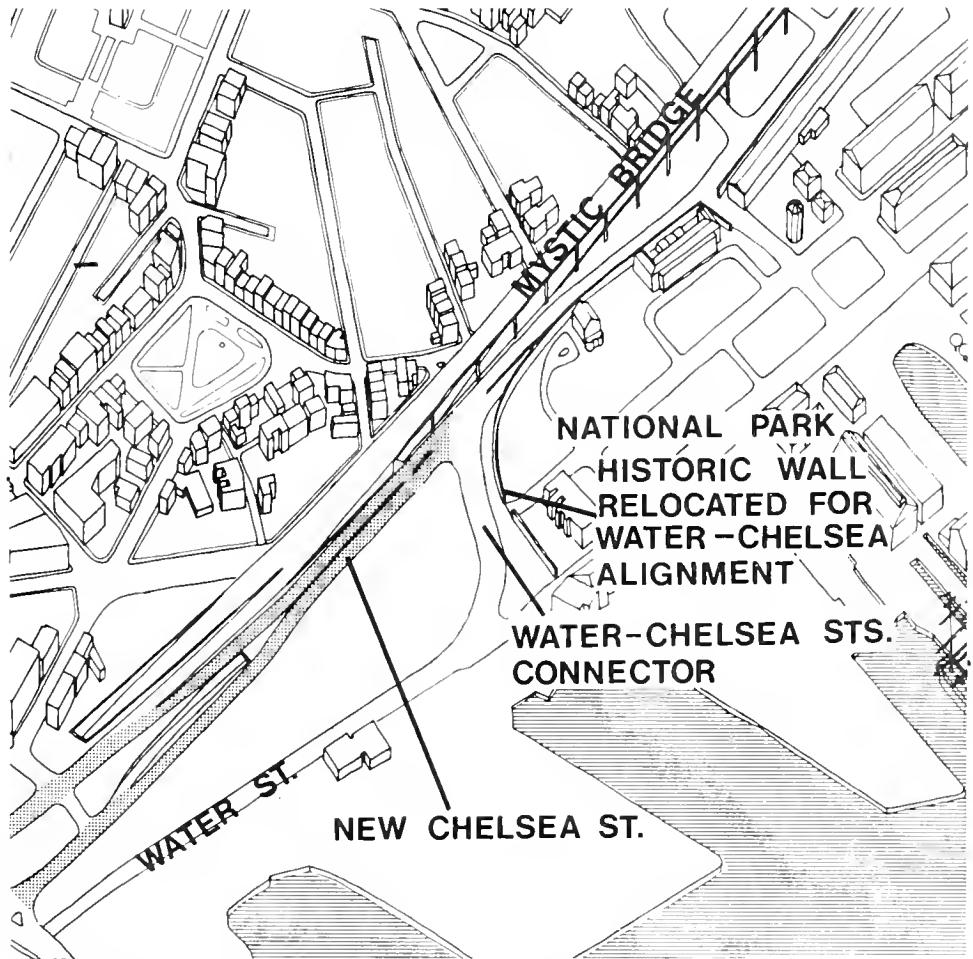


WATER-CHELSEA CONNECTOR ADDED

Figure VI-2

This figure shows the alignment proposed in Alternative 4 for the Water-Chelsea Connector. In this alignment, the right-of-way for the proposed connection would cut across a corner of the National Park and require moving the historic stone wall. The completion of the connection provides a new route for trucks from the Moran Terminal and seaport area, as well as access into the new National Park. With the completion of this facility, a perimeter roadway around the residential areas of Charlestown allows traffic to bypass neighborhood streets.

The roadways which are constructed as a part of the Water-Chelsea Connector are a vital improvement to traffic patterns in Charlestown. These improvements are compatible with both the existing expressway structures and with improvements proposed as part of Alternative 3 for the North Area.



**ALTERNATIVE 3: OVERHEAD RAMPS REMOVED
SURFACE STREET SCHEME**

Figure VI-3

Alternative 3 for the North Area contains several surface street options, each of which includes a new Chelsea Street alignment. New Chelsea Street would link to the Water-Chelsea Connector to provide continuity between City Square and the Naval Shipyard, the National Park and the seaport areas. This link of Chelsea Street would not require any right-of-way from the National Park because it would tie to the completed Water-Chelsea Connector.

The Water-Chelsea Connector is a separate project with its own timetable. As presently scheduled the project will be completed well before potential implementation of any of the alternatives proposed for the North Area improvements.



CITY OF BOSTON
PARKS AND RECREATION DEPARTMENT
ONE CITY HALL SQUARE
BOSTON, MASS. 02201

PETER G. MEADE
Commissioner

KEVIN H. WHIT
Mayor

May 17, 1977

Mr. Robert T. Tierney
Chief Engineer
Department of Public Works
100 Nashua Street
Boston, MA. 02114

Dear Mr. Tierney:

The Parks and Recreation Department of the City of Boston has received your letter of May 9, 1977 requesting certain information about City Square in the Charlestown section of Boston. Our understanding is that this information is required under the provisions of section 4 (f) of the Department of Transportation Act of 1966, as amended, as part of your on-going study of transportation alternatives in the North Area of the Central Artery corridor. In response to your request, we hereby submit the following information and findings:

Jurisdiction

City Square is a passive park in Charlestown, and has been under the continuous care and control of the Boston Parks and Recreation Department since consolidation of the Boston and Charlestown Park Systems in the 19th Century; therefore, jurisdiction of the property lies with this department.

Description

City Square consists of a small grass plot with a World War II monument, several shrubs, and three aging benches. It is located at the center of a heavily-used traffic circle and is overshadowed by elevated ramps serving the Mystic River Bridge and Interstate 93. The total area of the site is approximately 8739 square feet. Access to the property is available only by crossing through traffic. The site receives little or no active use. There are no deed restrictions on the property. No federal or state funds have been used at the site.

Statement of Significance

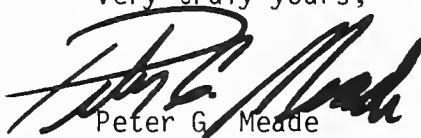
The Parks and Recreation Department finds that City Square is not significant for the purposes enumerated in section 4 (f). While it might appear to have recreational and/or historical characteristics, (being an open space in an old section of the city), the property does not serve these functions. The combined effect of the surface and

elevated transportation facilities has been to isolate the property and render it essentially useless. In addition, it has been allowed to deteriorate so that it has lost the minor ornamental value it once had. An ornamental iron fence was removed, as was a wooden flagpole which has rotted. Flower beds were not maintained.

In view of these various factors, this Department has determined that City Square Park is not significant. If one of the alternate proposals for improving the transportation facilities in the North Area of the Central Artery Corridor involves the taking of City Square the Parks and Recreation Department does not object to such taking provided that a new passive park of equal or larger area is acquired, constructed and transferred to the care, control and maintenance of this Department. Both the Community and the department must be involved in the site selection and design of the new park.

We wish to add, however, that the local community does wish to preserve the World War II memorial, though not necessarily in its present location. Similarly, I have noticed that your preliminary plans include opportunities for substantial renewal of City Square, including a new public open space. I would encourage the state to provide as many opportunities for new open space along the corridor. We sincerely hope that your plans for the area can progress, and we look forward to working with you to create an attractive and useable open space as part of your project.

Very truly yours,



Peter G. Meade
Commissioner

PGM/mh



VI

PUBLIC PARTICIPATION

CHAPTER VII. PUBLIC PARTICIPATION

VII.A. PROCESS

Public involvement which has led up to and been part of the development of this document follows upon a long history of public and community participation to find a solution to North Area transportation problems. Current efforts are part of a process which has been underway for the last decade, beginning with North Terminal studies, and leading to BTPR and its follow-up in the Central Artery Feasibility Study conducted by the BRA for the Mass. Department of Public Works. More recent studies by MDPW have built upon this work, and have included a program of community involvement in order to respond to community comments and objectives.

VII.B. PUBLIC INVOLVEMENT PROGRAM

Two slide shows were developed to provide information to the public on the overall program for proposed improvements to the Artery corridor and to generate comment from concerned citizens. One of the slide shows dealt specifically with North Area problems and potential improvements, including Alternatives 1, 2, and 3. Both slide shows have been presented to interested community groups and individuals, public agencies and responsible officials, and organizations with regional focus.

A Working Committee of local and regional interests was established to review the proposed improvements to the Artery corridor. Within the Working Committee, a selected list of representatives from the North Area was developed and is now included on all mailings, literature distributions, and invitations to public meetings.

In addition to slide shows and working committee meetings, special briefings have been held for parties with specific interests in proposed North Area improvements. They include Boston and Cambridge city officials, property owners, private organizations, and agencies which have a specific interest in the area, such as MassPort, which owns property in the area and owns and operates the Mystic River Bridge.

As a result of the above activities, a Corridor Planning Study was prepared for the North Area. This document was distributed widely throughout the community, placed in local public libraries, discussed in the local newspaper, distributed to regional organizations and public agencies, and was the subject of a Working Committee meeting prior to its review in a Public Information meeting held on December 1, 1976. Comments resulting from that meeting have been incorporated specifically into the statement of Community Objectives in Chapter III. These comments have been responded to in the form of revisions to the proposed alternatives and their effects, as reflected in this document. A detailed listing of comments is included in this chapter.

Following the preparation, distribution, and presentation of the CPS and its findings, an extensive period of contact and discussion with public officials and individuals was undertaken. As a partial project of this process, additional analysis was prepared on accidents, proposed federal participation in the funding of the project, and on costs, benefits and impacts of proposed alternatives. Results of these analyses are incorporated into this Environmental Assessment.

A second Public Information meeting was held on February 9, 1977, in Charlestown to review staff work done in response to comments made in the December Public Information meeting. Written and oral comments were received, and all of these have been incorporated into the preparation of this Environmental Assessment. A summary of comments and responses made at public meetings follows.

VII.C. PUBLIC COMMENTS AND RESPONSES

December 13, 1976 Information Meeting

The first series of questions dealt with the process the Department of Public Works intended to follow in developing this project. Mr. Sholock emphasized that there would be a series of meetings with presentations and discussions open to all.

The next series of questions dealt with the proposed connection between Water and Chelsea Streets. In response to questions, Mr. Horigan answered that the proposed improvements would not hold up the Water-Chelsea connector, and in fact could benefit if the connector were built first. In any event, the connection past the Navy Yard and over the proposed Little Mystic Bridge will be essential to remove truck traffic from local neighborhood streets.

The two options for local streets at City Square were discussed in some detail. It was agreed that Alternative A - the rotary scheme - would be possible, but would attract traffic onto local streets.

Alternative B, a simpler intersection, did not provide for connections into Main and Warren Streets directly. This option was not regarded as being sufficient for access into Charlestown. The MDPW agreed that joint staff efforts would be made to develop a new alternative which did not allow through traffic into Main and Warren Streets but which would allow for local access into the neighborhood.

Questions were also asked about access into the police and fire stations and the Court House. MBTA service needs were also emphasized as considerations.

The MDPW stated that the North Terminal schemes were dead because of proposed ramps and problems they would have caused. This proposed improvement is not as disruptive to the neighborhood or to the Charles River, which it does not cross.

Questions regarding economic impact were answered by statements that about 5000-6000 jobs could be created. One resident emphasized that Charlestown should get first priority on jobs created by the proposals. The MDPW response: it is probably not possible to give such priority, but it will be looked into for a response at the next meeting.

Other questions centered on pedestrian access and the need to obtain waterfront access from residential Charlestown. These elements will be included in the plans for City Square. Charlestown residents emphasized the need for buildable

parcels in City Square, and the problem in finding places to build new structures in Charlestown.

February 9 Information Meeting

The first question concerned the bike path along the river and whether it would be underground as it passed the rail tracks. Mr. Sholock said that preliminary designs show all construction above ground, including a potential new bicycle connection.

The next series of questions dealt with the relationship of the North Area project to other proposed improvements to the Artery. Mr. Sholock emphasized that the North Area was a project that could be undertaken irrespective of other improvements to the Artery but it could fit with any other improvements to the Artery. One community resident stated that the project was of substantial benefit to the community because it can be built by itself and that the proposal reflected the needs of the community as something more than a transportation corridor.

The next questions were directed to surface treatment in City Square. In response to a question of whether residences would be taken, Mr. Sholock said that none would be taken, but that one of the ramps connected to the Mystic Bridge would be close to homes on Park Street. Bus routes through the community were then discussed, with the assistance of the slides illustrating each of the surface alternatives. Community concern was focussed on the need for the retention of the service in a form similar to that at present; to do this may require the retention of Henley Street, which has been proposed to be closed to allow for new housing development. It was agreed that the surface street alternatives should be discussed in greater detail in the environmental assessment document.

Trucks from MassPort and the Moran Terminal were then discussed. The proposed truck routes were traced on the slides of each alternative. Trucks carrying dangerous cargoes were then discussed. Mr. Sholock agreed that further work would be done to explore the problem of dangerous cargoes in the new tunnels, or the need for them to travel on surface streets through City Square.

Pedestrian areas and parks were of concern. The pedestrian crossings over New Chelsea St. and their location in relation to the community were of particular interest. These will be explored in conjunction with the engineering of the project, to assure that pedestrians will be adequately accommodated. The replacement of City Square is also of concern; its size and character after redevelopment should include references to its historic character, including cobblestones, if possible. Mr. Sholock emphasized that cobblestones are difficult to maintain, but granite blocks would be possible at pedestrian crosswalks or as pavement within the Square itself.

Traffic access from the residential portions of Charlestown through City Square is also of major concern. In response to individual queries, Mr. Sholock traced the routes of autos from the residential areas through the Square in various directions - to Boston, to the Mystic Bridge, to the expressways. Some sentiment was expressed in favor of the surface street schemes which used least land in City Square. Mr. Sholock responded that the two new schemes for surface streets were about equal in merit for traffic service, and that further options could be explored in subsequent engineering analyses.



PAUL GUZZI

*The Commonwealth of Massachusetts
Office of the Secretary*

Massachusetts Historical Commission

*Secretary of the 294 Washington Street Boston, Massachusetts 02108
Commonwealth*
(617) 727-8470

December 9, 1976

Mr. Robert Sloane
Central Artery Working Committee
Central Transportation Planning Staff
27 School Street
Boston, Massachusetts 02108

Re: North Area Corridor Planning Study
Boston, Massachusetts

Dear Mr. Sloane:

The Massachusetts Historical Commission has reviewed the North Area Planning Study for the Central Artery and a member of my staff attended your presentation meeting November 29. Following the very informative meeting, we would like to make the following comments.

The planning document appears to quite thoroughly analyze present traffic problems and alternate plans for improvements. The meeting seemed to indicate that the underground route has been selected as a course of action. We strongly recommend that as the design proceeds, your planning adequately considers potential impacts the project may have on historic and architecturally significant above-ground properties and to archeological resources beneath ground level. Our office can provide assistance during your identification of cultural resources within the project impact area and technical assistance in avoidance or mitigation of adverse effects to these properties. Please do not hesitate to contact us. In addition, the Boston Landmarks Commission, as the official historic preservation agency of the City of Boston, can assist in identification of historic properties and should be provided an opportunity to review the project as designs progress.

Sincerely yours,

Elizabeth Reed Amadon

Elizabeth Reed Amadon
Executive Director
Massachusetts Historical Commission
State Historic Preservation Officer



CITIZENS FOR RAIL TRANSPORTATION

Straitsmouth Way - Rockport, MA 01966

10 December 76

Mr. Robert Sloane
Central Artery Project
Central Transportation Planning Staff
27 School Street
Boston, MA 02108

Dear Mr. Sloane:

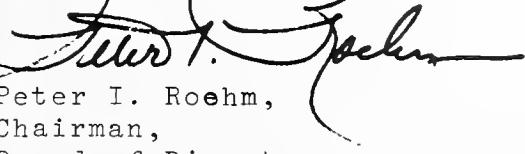
Reference is made to your letter/memo of 18 November requesting comment on the North Area Corridor of the Central Artery Project.

We of CRT wish to go on record as being in support of the Central Artery Project, in all phases, including the central depressed portion, conditioned only by the fact that this central depression MUST include at least two rail tracks for the connection of North and South stations. This we insist upon and if this provision is meant then we offer our support of your efforts.

Insofar as the third tunnel is concerned: we have no objection as long as this tunnel is limited in access to airport-bound traffic only and empties out at the airport and not on the streets of East Boston. This tunnel must be for buses, cabs, and airport-destined automobile traffic. If this tunnel is to be constructed for this purpose then we will favor its building.

Thus, Mr. Sloane, if the depressed section includes the minimum two rail tracks and the third tunnel is built for airport access only we find no other objection and will go on record as supporting the Central Artery Project.

Sincerely yours,



Peter I. Roehm,
Chairman,
Board of Directors



IN REPLY REFER TO:

L3027

United States Department of the Interior
NATIONAL PARK SERVICE
BOSTON NATIONAL HISTORICAL PARK
CHARLESTOWN NAVY YARD
BOSTON, MA. 02129

December 10, 1976

Mr. Robert Sloane
Central Transportation Planning Staff
27 School Street
Boston, Massachusetts 02108

Dear Mr. Sloane:

Thank you very much for inviting me to attend the meeting of the Central Artery Project Working Committee on November 29 and for the opportunity to review the North Area Corridor Planning Study.

My General impression of the proposed Central Artery project is that it will be extremely beneficial to Boston National Historical Park in removing the intrusive elevated structure from the immediate vicinity of two of our historic sites, the Charlestown Navy Yard and Faneuil Hall. Moreover, depression of the Central Artery will make it much easier for visitors to move from downtown historic sites such as Faneuil Hall to North End historic sites such as the Paul Revere House.

As to the North Area Planning Study, it would appear that the proposed depression of U.S.1 from the end of the Mystic River Bridge, with a tunnel under City Square, and connection with Interstate 93 in the vicinity of the Boston and Maine rail yards would have extremely beneficial effects on the park. The approach to the Charlestown Navy Yard from Boston proper would be simpler for visitors and more visually attractive with the present system of elevated roadways and approaches eliminated and the connection with I-93 removed to the far side of City Square. To a lesser extent, the visitor's approach to Bunker Hill from Boston proper and from the Navy Yard will be easier and more pleasing aesthetically.

Please be aware of our continuing concern in keeping any encroachment on the Charlestown Navy Yard, particularly in the vicinity of the Commandant's House, to an absolute minimum. It would seem that the



impacts on the Commandant's House and the adjacent stone wall are considerably less in the North Area Planning Study than in current proposals for a Water-Chelsea connector as a simple roadway would pass through the area rather than a roadway and complicated system of ramps. In fact, we might suggest accelerating the North Area Planning Study and decelerating the Water-Chelsea proposal in the interest of preserving as much of the area around the Commandant's House as is humanly possible.

We also ask that you keep in mind our continued interest in better mass transportation to the Charlestown Navy Yard. One possibility would be the use of the existing rail spur from the B&M yards to the Navy Yard for use by light rail vehicles with an improved connection to the North Station area.

The North Area Planning Study has not been reviewed in detail by the Department of the Interior. As a result, the opinions expressed in this letter are my own, and do not reflect the official position of the Department.

Sincerely yours,

Hugh D. Gurney
Hugh D. Gurney
Superintendent



Greater Boston
Chamber of Commerce
125 High Street
Boston, MA 02110
Tel: 426-1250

November, 1976

CHAMBER POLICY ON THE CENTRAL ARTERY DEPRESSION PROJECT

SUMMARY:

The Chamber supports the North Segment of the Central Artery Proposal. While not endorsing the South Segment, the Chamber supports further investigation as to the engineering feasibility, traffic disruption and capacity of the south portion of the Central Artery Proposal. This analysis must include the third harbor crossing as an essential part of the traffic improvements necessary for Boston and Eastern Massachusetts. Increased capacity and the effects of construction for an extended period must be shown before any commitment is made to the Central Segment of the Artery Depression. The Chamber is opposed to the North Station/South Station rail tunnel, the need for such a link has not been shown. In addition, a sufficient network of rapid transit for commuter travel already exists.

The Massachusetts Department of Public Works must disclose the effects of committing substantial state and federal funds on one highway project, as well as, analyze the transportation benefits and the engineering feasibility of each segment. The Central Artery Project represents a substantial drain on federal interstate highway funds earmarked for Massachusetts. As a result, necessary highway projects elsewhere

-2-

in the state may be deferred. In a sense, these deferred projects would be an additional cost the state would have to bear to depress the Artery. These costs should be known to the public and state government before the Central Artery Depression Project is undertaken. The Chamber urges a full disclosure as to the ripple effects the Artery project would have on other highway projects in Massachusetts.

BACKGROUND:

In 1971, the idea of depressing the Central Artery gained some attention during the deliberations of the Boston Transportation Planning Review (BTPR). Since then the proposal has been through several processes. A preliminary feasibility study was prepared by the Boston Redevelopment Authority under contract from the Massachusetts Department of Public Works. This study was completed in mid-1975. While it indicates that a depression of the Artery is feasible, the B.R.A. pointed out several reasons why the project should not be undertaken at this time. The Central Transportation Planning Staff (CTPS) in conjunction with the Central Artery Feasibility Study, has completed a slide show on the Central Artery and its possible depression. This CTPS proposal represents current Massachusetts Department of Public Works engineering concepts for depression of the Artery.

-3-

CTPS/MASSACHUSETTS D.P.W. PROPOSAL:

The current Central Artery Depression proposal includes three segments:

They are:

1. North Segment; from North Station to the Mystic River Bridge and I-93, this includes a low-level Charles River crossing and road reconstruction, at grade or below grade, in Charlestown.

Estimated Costs: \$ 70,000,000

2. South Segment; from South Station to the Massachusetts Avenue exit, this includes a tunnel constructed along the edge of the Fort Point Channel for north bound traffic only. (The existing Dewey Square Tunnel would be for south bound traffic only.)

Estimated Costs: \$150,000,000

3. Central Segment; from South Station to North Station, this includes depression of the Artery by excavation under the existing elevated structure, as well as a rail connection between North and South Stations.

Estimated Costs: \$600,000,000

Total Estimated Costs: \$820,000,000
(1975 Dollars)

-4-

NORTHERN SEGMENT:

The Chamber supports the concept of the Northern Segment. Bearing in mind that this segment is separable from the overall Central Artery Proposal, the roads included in this project have been a high priority concern for some time. In the past, the Chamber has supported proposals to resolve traffic conflicts in the North Station and Charlestown areas. The Northern Segment project responds to long standing concerns for this area. It has substantial transportation benefits which appear to justify its cost.

Based on the need and the resulting benefits of the project, the Northern Segment of the Central Artery Proposal warrants extensive and accelerated study. Engineering and environmental analysis should be undertaken immediately. Pending the results of this review, the public and the Chamber will be better able to formulate a position on the project's details.

SOUTHERN SEGMENT:

The Chamber supports continued investigation as to the engineering feasibility, the traffic disruption and possible capacity improvements of the Southern Segment. This analysis will provide the basis for the further decision on whether or not to move forward with preliminary engineering and environmental review. This phased analysis and decision-making process is essential to avoid commitment to the South Segment project before the real costs and benefits have been ascertained.

The Chamber's support for continued study of the Southern Segment is tempered by one major concern. Current proposals for this portion of the Central Artery fail to include the concept of a third harbor crossing. While this harbor tunnel is included in the Massachusetts Interstate Cost Estimates filed with the Federal Highway Administration, the Southern Segment does not refer to this project. Analysis has already shown that a third harbor tunnel crossing has substantial transportation benefits including benefits related to capacity of the Central Artery. Some have argued that the Southern Segment cannot stand alone in a cost/benefit analysis unless the crossing is part of the design. Indeed, it may be reasonable and desirable to construct the third harbor crossing and the Southern Segment together. The harbor crossing project should be analyzed in conjunction with the engineering feasibility and capacity study for the Southern Segment.

CENTRAL SEGMENT:

The Central Segment of the Artery proposal is the most controversial and complex portion. The Artery would be depressed between Dewey Square and North Station, and a rail connection would be made between North and South Stations. The Northern Segment and the Southern Segment must be committed to construction in order to move forward on this center portion.

There are two paramount concerns which must be addressed before the Central Artery Project can be discussed intelligently. The first is the question of improved capacity for the Artery. With a price tag of \$600 million, substantial traffic capacity improvements must accrue to the Artery beyond the aesthetic

-6-

benefit resulting from the depression. Currently 125,000 vehicles utilize this highway daily. This demand is expected to increase. Reconstruction of the Artery must include major capacity improvements in order to justify the enormous cost. Even the aesthetic benefits must be fully detailed. The Artery is an elevated barrier between the City and the waterfront. Even with the depression, the Artery will still constitute an obstacle.

The second major concern which must be analyzed and disclosed is the scale and duration of traffic disruptions during construction. With the current proposal, which seeks to minimize such disruption, no presentation has been made as to what the effects will be. While this concern may seem transitory, several years of traffic dislocation on the Artery and service roads will have a substantial effect on the people who live and work in the construction zone. Convenient and continual access is essential to the business fabric of downtown Boston. The traffic disruption costs must be disclosed and analyzed prior to any commitment on the part of the City, State or Federal Government.

The Chamber believes that increased capacity and genuine transportation benefits must be shown before the state and federal governments commit themselves to such an enormous undertaking. The Chamber supports efforts to present a design that substantially increases capacity on the Artery to justify its costs. In addition, the very real question of disruption during construction and its effects on the area must be presented. This has not been done. The Chamber supports a detailed analysis of the disruption impacts a project of this size will have on the City.

The Chamber is opposed to the construction of a North Station to South Station rail tunnel. The rail link between these stations complicates construction and adds to the cost of the Central Segment of the Artery Proposal. No evidence has been presented to establish a need for such a link. A sufficient network of rapid transit exists, and additional portions are planned, which facilitate commuter travel within the core area. In order to utilize a Central Artery rail tunnel and to integrate it into our area rail system, it is necessary to electrify the Boston commuter rail network. The cost of this electrification appears staggering.

CHARLESTOWN ARMED SERVICES Y.M.C.A.
 32 CITY SQUARE
 CHARLESTOWN, MASS. 02129

STATEMENT

Since 1972, we at the YMCA were made aware of plans being developed by BRA-Transportation Dept. to alleviate traffic problems at City Square, Charlestown. The latest scheme being the City Square, Chelsea-Water Street Connector dated October, 1975. Since our YMCA was being affected, we were invited to participate in the formulation of the various schemes. Mr. Arthur Reilly and Mr. Phil Carusso and others from BRA-Transportation Dept. are to be commended for their efforts in the coordination and formulation of these plans.

On September 24, 1976, the Charlestown YMCA Executive Director was in contact with BRA to inquire about latest developments in the City Square area. We were told that the scheme of October, 1975 is still in effect but "shelved" because of the "push" to depress the central artery. There is talk of re-construction of the scheme and the YMCA will be kept informed of any future happenings.

In November, 1976, the YMCA received [REDACTED] the booklet entitled Central Artery Corridor Study, October, 1976 issue. On Page 44 of this study it states ..."In discussions with community leaders to date, there has been no objection to the potential taking of this structure" (the YMCA). This statement was also published in the Charlestown Patriot.

As a result of a meeting of our lay leadership on January 25, 1977, a letter has been sent to the Commissioner of State DPW asking for identification of those community leaders who participated in the discussions with DPW prior to the publication of the October issue here-to-fore mentioned, and further inquiring as to why officials from the YMCA were not contacted.

The Charlestown YMCA is on record as to the approval of the October, 1975 City Square scheme as prepared by BRA. Our lay leadership and proper officials from the YMCA presently object to any such transportation improvement plans that would result in the taking of our YMCA structure at 32 City Square.

We trust also that the Charlestown YMCA will be involved in any future discussions concerning the improvement of the traffic problem in the City Square area.

Sincerely yours,

Arthur D. Marcotti

Arthur D. Marcotti, Ch.
 YMCA Committee of Management

Roger P. Maphis

Roger P. Maphis, Exec. Dir.
 Charlestown YMCA



CITY OF BOSTON
OFFICE OF THE MAYOR
CITY HALL, BOSTON

KEVIN H. WHITE
MAYOR

Mr. John J. Carroll
Commissioner
Massachusetts Department of Public Works
100 Nashua Street
Boston, Mass.

Dear Commissioner Carroll:

I am pleased to see the State undertaking an analysis of the methods, costs and effects of depressing the Central Artery - a project that has been a favorite dream for many of us over the past several years.

We, of course, want to be intimately involved in this process. Emily Lloyd will serve as my designee, keeping me informed and bringing in other City of Boston representatives when necessary.

Sincerely,

A handwritten signature in black ink, appearing to read "Kevin H. White".

KEVIN H. WHITE
MAYOR

KHW:tss
cc: Fred Salvucci
Robert Vey
Katherine Kane
Robert Walsh

DEPARTMENT OF PUBLIC WORKS
OFFICE OF THE COMMISSIONER
December 2, 1970
RECEIVED DEC 8 1970

100 103

T35 U.S. Dept. of Trans.
U73T Federal Nighway Admin.
c.2 Dept. of Public Works.
U.S. Interstate 93 & U.S.

Route 1, Central Artery, draft
environmental impact statement
Boston: May 1977.



